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Vol. 20. No. 5 MAY, 1922

THE METAL INDUSTRY

WITH WHICH ARE INCORPORATED

THE ALUMINUM WORLD: COPPER AND BRASS: THE BRASS FOUNDER AND FINISHER

ELECTRO-PLATERS REVIEW

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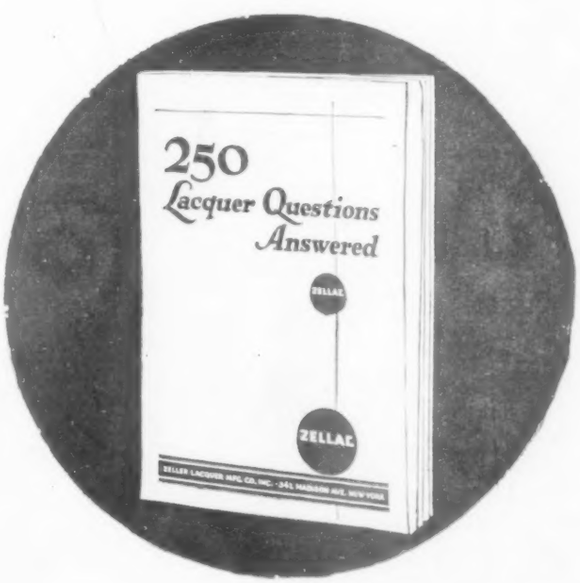
250 Lacquer Questions Answered



Here is a new 32-page booklet, just off the press, which we have prepared for free distribution among the technical men interested in finishing as well as for those engaged in lacquer departments. This booklet answers 250 practical lacquer questions and tells how every recognized difficulty can be overcome. Every man confronted with finishing problems will find this booklet a valuable reference. It will prove an asset every working day in the year.

All practical, progressive men want this booklet. Have you written for your copy? If not, do so today. It will gladly be mailed you absolutely free.

ZELLAC

ZELLER LACQUER MFG. CO., INC. - 342 MADISON AVE. NEW YORK

The New Home of

Now We Are Able to Serve You

Following is a brief explanation of the above layout of our immense, up-to-the-minute, new plant:

To begin with, our plant is located on a five-acre lot bounded by four streets. We have Penna R. R. siding, consisting of 2600 feet of rails, part of which runs through one end of the larger building and is served by the electric crane.

To the left, in the foreground of the illustration, is our Warehouse—a daylight building of structural steel frame with Lupton Steel Sash. This building is 140 feet long by 104 feet wide. The basement is nine feet high, and the front floor eleven feet. With balconies all around the second floor, we have a warehouse area of 40,000 square feet.

Three jib-cranes, air hoists, and power elevator form the main part of the equipment. In this building also, on the second floor, are our general offices. The large building at the right, in illustration, is our Foundry Equipment Manufacturing Plant. This building is of the same construction as the building described above and is 200 feet long by 114 feet wide. The main or middle bay is 30 feet high and 50 feet wide, with a 20-ton capacity runway served for present needs by a 10-ton electric crane. There are two 32-foot wide side bays served by three 3-ton hand power cranes, and five 3-ton capacity jib-cranes with air hoists.

J. W. Paxson Co.

THE METAL INDUSTRY
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THE ALUMINUM WORLD: COPPER AND BRASS: THE BRASS FOUNDER AND FINISHER:
ELECTRO-PLATERS REVIEW.

Vol. 20 New York, May, 1922 No. 5

Rochester the Foundrymen's Convention City

The 1922 Meeting of the American Foundrymen's Association to Be Held Jointly with the Institute of Metals Division of the A.I.M.E. in Rochester, N. Y., June 5-9, 1922

Written for The Metal Industry by G. B. ELLIS, Rochester, N. Y.

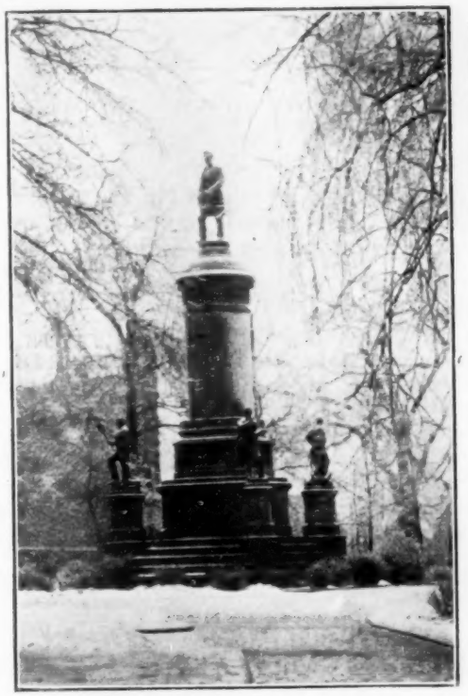
In the selection of Rochester, New York, as the city in which to stage the national convention of the American Foundrymen's Association, which will be held from June 5 to 9, it is to be doubted if the individuals who had to do with the selection could have decided upon a better city.

Rochester has long been famed for its hospitality, its beautiful parks and, above all, its remarkable array of elaborate and extensive facilities for handling a convention or exposition of almost any type. At Exposition Park, where the entire business pertaining to the convention will be located, visitors and delegates to the convention will have an opportunity to view an exhibit this year which will be larger than any previous ones with the exception of Philadelphia and Columbus.

In Buildings 3, 4 and 5, at Exposition Park, will be housed every type of exhibit in connection with the foundry. According to information received from exhibitors and from a brief survey of their plans there is every indication that the exhibit this year will be one of the most interesting ever attempted by the Association.

Virtually every foot of available floor space in the three exhibition buildings has already been reserved by exhibitors. The technical program to be carried out in connection with the exhibit this year will be an unusually good one, so good in fact that every foundryman in the country should attend if it is all possible.

It is interesting to more than the American Foundrymen's Association, since its formation has held conventions in practically every city of importance in the United States. A list of convention cities and presidents at the time follows:



SOLDIERS' AND SAILORS' MONUMENT AND FIGURE OF LINCOLN. CONVENTION HALL SQUARE, ROCHESTER, N. Y.

YEAR	CONVENTION CITY	PRESIDENT
1896	Philadelphia	*Francis Schuman, Philadelphia.
1897	Detroit	*Francis Schuman, Philadelphia.
1898	Cincinnati	*Francis Schuman, Philadelphia.
1899	Pittsburgh	*C. S. Bell, Hillsboro, O.
1900	Chicago	J. S. Seaman, Pittsburgh.
1901	Buffalo	W. A. Jones, Chicago.
1902	Boston	*J. S. Sadlier, Springfield, O.
1903	Milwaukee	A. W. Walker, Boston.
1904	Indianapolis	*Willis Brown, Youngstown, O.
1905	New York	Chris J. Wolff, Chicago.
1906	Cleveland	*Thos. D. West, Cleveland.
1907	Philadelphia	W. H. McFadden, Ponca City, Okla.
1908	Toronto	Stanley G. Flagg, Jr., Philadelphia.
1909	Cincinnati	L. J. Anthes, Toronto, Ont.
1910	Detroit	Arthur T. Waterfall, Detroit.
1911	Pittsburgh	*Maj. Jos. T. Speer, Pittsburgh.
1912	Buffalo	*Maj. Jos. T. Speer, Pittsburgh.
1913	Chicago	H. D. Miles, Buffalo.
1914	Chicago	Alfred E. Howell, Nashville, Tenn.
1915	Atlantic City	R. A. Bull, Sewickley, Pa.
1916	Cleveland	R. A. Bull, Sewickley, Pa.
1917	Boston	J. O. Pero, Montreal, Canada.
1918	Milwaukee	B. D. Fuller, Niagara Falls, N. Y.
1919	Philadelphia	A. O. Backert, Cleveland.
1920	Columbus	C. S. Koch, McKeesport, Pa.

*Deceased.

ROCHESTER METAL INDUSTRIES

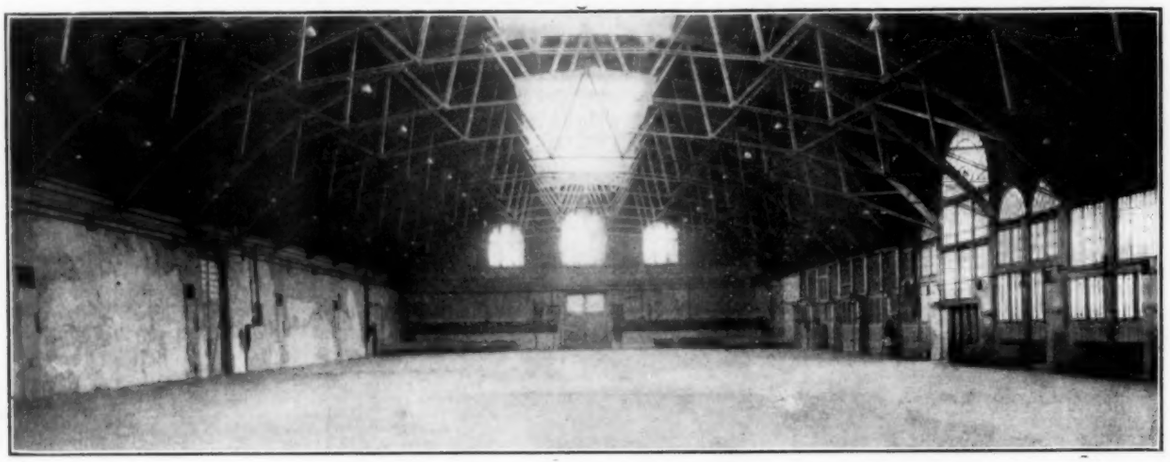
The metal industry in Rochester, insofar as the employment of non-ferrous metals are concerned, dates back

to a period long before the Civil War. The advance guard of these enterprises included such men as Junius Judson, James Sargent, Halbert S. Greenleaf, D. R. Barton, F. Erdle, and Lewis Selye. In the very early days, dating back as far as 1832, a small amount of brass molding was done in the Selye foundries, which included among its products a really effective fire engine. Many of the brass and nickel parts were eventually poured and finished up in the Selye plant, which made it one of the real pioneers in Rochester in that line of industry. In 1836 William Kidd purchased the plant and also began the making of steam fire engines in connection with other furnace work.

In 1872 H. N. Hemingway established a foundry at River and North Water streets, where small castings, nickel-plating, and japanning was first begun. Later Munn, Converse and Anstice absorbed the plant and advanced the plating business to large proportions. Finally Josiah Anstice & Company took over the business and further developed it, at times employing 100 men in the plating rooms.

The steam Gauge and Lantern Company, whose extensive plant was destroyed by fire, with much loss of life, in the fall of 1888, was a pioneer in the use of tin and brass wire. In the best years of its existence it consumed 12,000 boxes of tin and 24,000 bundles of brass wire in a season. The plant was never rebuilt.

In the year 1867 Sargent & Greenleaf established a

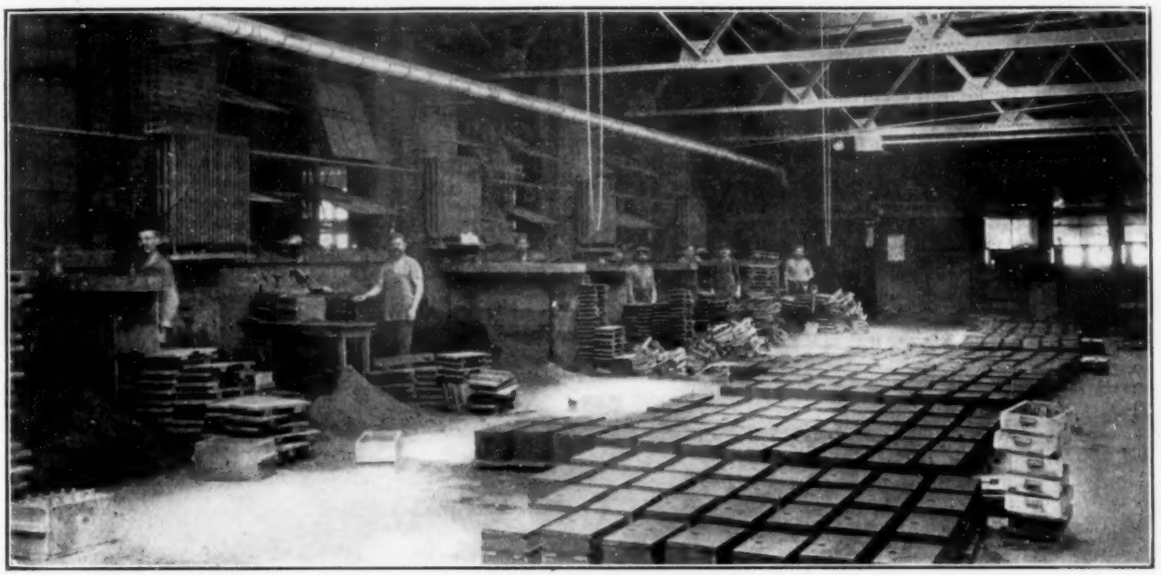


INTERIOR OF ONE OF THE CONVENTION HALL BUILDINGS, ROCHESTER, N. Y.

PLAN OF BUILDINGS 3, 4 AND 5, CONVENTION HALL, ROCHESTER, N. Y. THE METAL INDUSTRY WILL OCCUPY SPACE 334 IN BUILDING 3. (SEE ARROW AT RIGHT OF PLAN.) VISITORS WELCOME.

lock factory at Court and Stone streets. Its products are known throughout the world. The specialty is bank and burglar-proof locks, automatic and combination locks and chronometer time locks. Perfected and delicate machinery are required in the making of these products. A few years ago the firm erected a new plant in Norton street, where they now have one of the finest brass molding equipments in the country. The firm makes all of its lock castings from the highest grades of brass, and employs a fairly large force the year around.

1883 by George Atkinson, who began his apprenticeship without a dollar, and by sheer energy developed one of the most interesting and widely-known industries in Rochester. The facilities of this model establishment permit the largest castings in all of the non-ferrous metals. In fact, scores of firms throughout the country send their requirements for large castings to the Atkinson foundry. Samson Manganese Bronze is a special product of this concern. The brass molding shop has a capacity of ten tons a day, and in normal times about



NORTH-WEST FOUNDRY, ROCHESTER, N. Y.

The James Cunningham Son & Company, carriage and automobile works at 13 Canal street, have a small brass foundry, which produces all the castings required by their output. The concern does much nickel-plating, this department being most complete and effective. The original plant was founded in 1838.

The Atkinson Company, which occupies a model plant near the city line in Lyell avenue, is one of the original founders and manufacturers of aluminum, brass and bronze goods in this city. The plant was established in

200 men are employed. The ingot brass is melted with coal, coke, and oil. The plant has two core ovens, 14 x 26 feet in dimensions, large enough to permit the running of cars and holding about three tons of sand. A short while ago the foundry cast what is known as a runner crown for the Niagara Power Company of Niagara Falls.

One of the largest and best equipped foundries is the North-West Foundry, Inc., the president of which is Charles E. Tepper. At the present time it is operating

MOLDING DEPARTMENT, BAUSCH & LOMB OPTICAL COMPANY, ROCHESTER, N. Y.

on a 125 per cent basis. It is running about two tons of aluminum and two tons of brass and bronze every day. It specializes in the small work, especially that pertaining to the automobile industry. Approximately 350 motors and kindred appliances are turned out at the foundry each day. At present, it employs about 500 men, including laborers. The available floor space at the North-West Foundry, Inc., totals four and one-half acres all under one roof, the building being 230 x 250 feet. If one is to include the gray iron work it is safe to say that more than eighteen tons of metal is poured at this place each day. In connection with the small work which is being done at the foundry one of the most noteworthy jobs of a statuary nature is the set of statues adorning the turnstiles in the Grand Central Station in New York. These were acknowledged to be one of the finest pieces of work of their kind that can be found.

The Flower City foundry has a plant for jobbing trade orders, and enjoys a good trade. The character of the output is most creditable.

The Taylor Instrument Companies operate a brass foundry for small castings, the output being limited to the requirements of the concern. The plant is one of the few in Rochester which has been making a steady come-back to normal conditions since the close of the war.

Business has been rather quiet in the large plant of the General Railway Signal Company, and the activity of its brass molding shop has been limited. The company makes all manner of brass, bronze and aluminum castings, which are required in the production of the railway signalling materials and an electric clothes washer of considerable proportions.

The National Brass Manufacturing Company is in reality Henry Wray & Sons, whose extensive business is located at Nos. 256-258 State street. It is probably the oldest concern of its kind in Rochester. The company specializes in small metallic castings, including such items as trolley wheels, ears, faucets such as attached to oil tank wagons and the like. The output of bronze compositions in this plant is exceedingly large.

The Rochester Bronze and Aluminum Company in Marietta street is a plant of growing importance. It is a jobbing foundry, with a large and increasing output.

The Bastian Brothers use considerable bronze and brass for their specialties, much of the brass being produced in rolled sheets.

The non-ferrous metals department in the Bausch & Lomb optical works is of the highest class. A new foundry for the producing of brass and aluminum castings was erected during the war, and is said to be without peer in the country. At the present time a score of molders are kept busy, but in normal times the force is much larger. The character of the optical company's output requires use of all the non-ferrous metals, and the concern makes all of its various parts within its own plant.

The brass and aluminum foundries attached to the plants of the Eastman Kodak Company turn out small castings for the more delicate parts used in the making of cameras. In the aluminum furnace department for several months experiments have been going on in the production of a metal of the same character as aluminum, which is said to be even lighter and tougher than the parent metal. Aluminum is perhaps the base of this new product, the real composition of which remains a secret with the Eastman Company. It is said this metal may eventually become highly advantageous in construction of aeroplanes and structures requiring lightness and great strength.

Rochester manufacturers can give no special reason for the fact that this city had developed into an important center for the production of non-ferrous metal materials. With the expansion of the steel and iron industry here, mainly in stove and furnaces and later car wheels, it was only natural that molding establishments of the other metals should follow. Twenty-five years ago much finished brass material was obtained out of town. A large percentage of that business is now confined to the city, being produced in local plants. The development of the aluminum branch of the industry here has been due in a measure to the proximity of the aluminum headquarters at Niagara Falls and at Pittsburgh with a direct connection over the Buffalo, Rochester & Pittsburgh Railroad.

TWO METAL MEN FOR A. F. A. EXECUTIVES

G. H. CLAMER,
Nominee for Vice-President.

L. W. OLSON,
Nominee for Director.

EXHIBITION MANAGER

C. E. HOYT,
Secretary, A. F. A.

NEW OFFICERS

The Nominating Committee of the American Foundrymen's Association, appointed by the Board of Directors at a meeting of the Board on December 7, 1920, have reported that at a meeting of the committee in Cleveland, Saturday, March 11, 1922, the following who need no introduction as they are all well known in the metal industries were unanimously nominated for officers of the American Foundrymen's Association:

FOR PRESIDENT,
C. R. MESSINGER,
Chain Belt Co., Milwaukee, Wis.

FOR VICE PRESIDENT,
G. H. CLAMER,
Ajax Metal Co., Philadelphia, Pa.

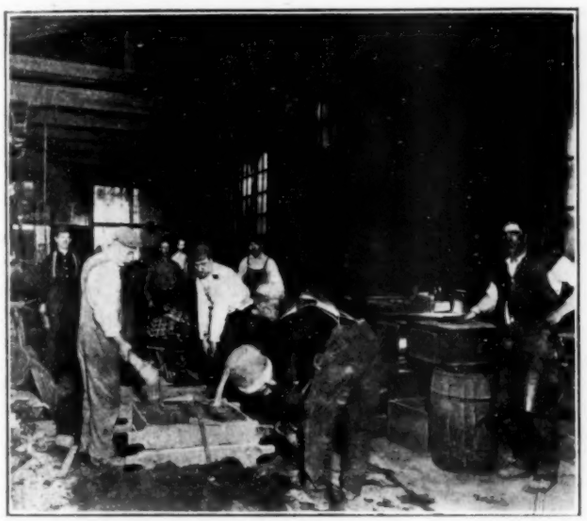
FOR DIRECTORS FOR THREE YEARS:
C. B. CONNELLEY,
Commissioner of Labor and Industry, Harrisburg, Pa.

FRED ERB,
Packard Motor Car Co., Detroit, Mich.

C. E. HOYT,
American Foundrymen's Association, Chicago.

L. W. OLSON,
Ohio Brass Co., Mansfield, Ohio.

A. B. ROOT, Jr.,
Hunt-Spiller Manufacturing Corporation, Boston, Mass.



ROCHESTER BRONZE AND ALUMINUM COMPANY, ROCHESTER, N. Y.

Papers on Metals for Rochester Meeting

INSTITUTE OF METALS DIVISION

"Cracks in Aluminum-alloy Castings," by Robert J. Anderson.

"The Effect of Impurities on the Oxidation and Swelling of Zinc-Aluminum Alloys," by M. M. Pierce and Mr. Brauer.

"Temperature Problems in Foundry and Melting Room," by John P. Goheen.

"Core-oven tests," by F. L. Wolf and A. A. Grubb.

"Occurrence of Blue Constituent in High Strength Manganese Bronze," by E. H. Dix, Jr.

"Gas Absorption and Oxidation of Non-Ferrous Metals," by Bruno Woyski and John W. Boeck.

"Some Interesting Unsolved Problems of the Foundry," by W. M. Corse.

"Foundry Difficulties," by Adolph Bregman.

"Physical Properties of Cartridge Brass," by C. Upthegrove and W. G. Harbert.

"Effects of Impurities on Electrolytic Zinc," by G. D. Scholl.

"Mechanicism of Metallic Oxidation at High Temperatures," by N. B. Pilling and R. E. Bedworth.

"Extreme Sensitiveness of the Action of Reducing Atmospheres Upon Heated Copper," by T. S. Fuller.

"Some Electrical Properties of Nickel and Monel Wires," by F. M. Sebast, M. A. Hunter and A. Jones.

AMERICAN FOUNDRYMEN'S ASSOCIATION PAPERS

"Aluminum and Aluminum-Alloy Melting Furnaces," by R. J. Anderson, Bureau of Mines, Pittsburgh, Pa.

"Melting Aluminum for Rolling Into Sheet," by J. A. Lange, Western Springs, Ill.

"Use of Secondary Aluminum Ingot in Foundry Practice," by W. M. Weil., National Smelting Co., Cleveland, O.

"Technical Control of McCook Field Foundry," by E. H. Dix, Jr., McCook Field, Dayton, O.

"The Use of Secondary Metal in the Brass Foundry," by C. T. Bragg, Michigan Smelting & Refining Co., Detroit, Mich.

"Porosity of Non-Ferrous Metals," by R. R. Clarke, Pittsburgh, Pa.

"An Investigation of Segregation with a View to Preventing its Occurrence in Castings Made of High-Lead Bronze," by Prof. R. E. Lee, and F. B. Trace, Allegheny College, Meadville, Pa.

"Two-Part Castings made in Three-Part Molds," by W. H. Parry, Brooklyn, N. Y.

"Tests with Cerium as a Deoxidizer and Desulphurizer in Red Brass, Cast Iron and Converter Steel," by L. W. Spring, Crane Company, Chicago.

"Selection of Fuels and Furnaces for Melting Copper and Brass Alloys," by T. H. A. Eastick.*

"Brass Forgings," by C. G. Heiby, Mueller Metals Co., Port Huron, Michigan.

*Deceased.

List of Exhibitors

Acheson Graphite Co.	Niagara Falls, N. Y.
Air Reduction Sales Co.	New York, N. Y.
Ajax Metal Company	Philadelphia, Pa.
Allan Manufacturing & Welding Co.	Buffalo, N. Y.
American Foundry Equipment Co.	New York, N. Y.
American Woodworking Machinery Co.	Rochester, N. Y.
Arcade Manufacturing Co.	Freeport, Ill.
Armstrong-Blum Mfg. Co.	Chicago, Ill.
Asbury Graphite Mills	Asbury, N. J.
E. C. Atkins & Co.	Indianapolis, Ind.
Austin Company	Cleveland, Ohio.
Bacharach Industrial Instrument Co.	Pittsburgh, Pa.
Badger Tool Co.	Beloit, Wis.
Balbach Smelting & Refining Co.	New York, N. Y.
C. O. Bartlett & Snow Co.	Cleveland, Ohio.
Basic Mineral Co.	N. S. Pittsburgh, Pa.
Bastian-Blessing Co.	Chicago, Ill.
Bausch & Lomb Optical Co.	Rochester, N. Y.
Beardsley-Piper Co.	Chicago, Ill.
Beaudry & Co., Inc.	Boston, Mass.
Bethlehem Steel Co.	Bethlehem, Pa.
S. Birkenstein & Sons, Inc.	Chicago, Ill.
Black Diamond Saw & Machine Works	Natick, Mass.
Blystone Manufacturing Co.	Cambridge Spgs. Pa.
Bonnot Co.	Canton, Ohio.
Brass World Publishing Co.	New York, N. Y.
Chas. J. Clark Blastmeter Co.	Gladbrook, Ia.
Carborundum Co.	Niagara Falls, N. Y.
Frank D. Chase, Inc.	Chicago, Ill.
Chicago Crucible Co.	Chicago, Ill.
Chicago Pneumatic Tool Co.	New York, N. Y.
Clark Tructractor Co.	Buchanan, Mich.
Cleveland Crane & Engineering Co.	Wickliffe, Ohio.
Cleveland Flux Co.	Cleveland, Ohio.
Cleveland Pneumatic Tool Co.	Cleveland, Ohio.
Clipper Belt Lacer Co.	Grand Rapids, Mich.
Thomas E. Coale Lumber Co.	Philadelphia, Pa.
Cochrane-Bly Co.	Rochester, N. Y.
F. A. Coleman	Cleveland, Ohio.
Combined Supply & Equipment Co.	Buffalo, N. Y.
Davenport Machine & Foundry Co.	Davenport, Iowa.
Dayton Pneumatic Tool Co.	Dayton, Ohio
Debevoise Anderson Co., Inc.	New York, N. Y.
Wm. Demmler & Bros.	Kewanee, Ill.
Detroit Electric Furnace Co.	Detroit, Mich.
Henry Disston & Sons	Tacony, Phila., Pa.
Joseph Dixon Crucible Co.	Jersey City, N. J.
Doehler Die Casting Co.	Brooklyn, N. Y.
Electric Furnace Co.	Salem, Ohio
Electro Refractories Corp.	Buffalo, N. Y.
Federal Malleable Co.	West Allis, Wis.
Foundry Equipment Co.	Cleveland, Ohio
General Electric Co.	Schenectady, N. Y.
Globe Iron-Crush & Shot Co.	Mansfield, Ohio
Robert Gordon, Inc.	Chicago, Ill.
Grimes Molding Machine Co.	Detroit, Mich.
Hanna Engineering Works	Chicago, Ill.
Clement A. Hardy Co.	Chicago, Ill.

R. G. Haskins Co. ..... Chicago, Ill.
Hayward Co. ..... New York, N. Y.
Herman Pneumatic Machine Co. ..... Pittsburgh, Pa.
High Speed Hammer Co. ..... Rochester, N. Y.
Hill & Griffith Co. ..... Cincinnati, Ohio
Hoevel Manufacturing Corp. ..... Jersey City, N. J.
Holcroft & Co. ..... Detroit, Mich.
Hyatt Roller Bearing Co. ..... New York, N. Y.
Independent Pneumatic Tool Co. ..... Chicago, Ill.
Industrial Controller Co. ..... Milwaukee, Wis.
Ingersoll-Rand Co. ..... New York, N. Y.
International Molding Machine Co. ..... Chicago, Ill.
Iron Age ..... New York, N. Y.
Spencer Kellogg & Sons, Inc. ..... Buffalo, N. Y.
Kuehnle Co., Inc. ..... Philadelphia, Pa.
H. M. Lane Company ..... Detroit, Mich.
Lave Crucible Co. ..... Pittsburgh, Pa.
Leeds & Northrup Co. ..... Pittsburgh, Pa.
Link Belt Co. ..... Chicago, Ill.
David Lupton's Sons Co. ..... Philadelphia, Pa.
J. S. McCormick Co. ..... Pittsburgh, Pa.
Machinery ..... New York, N. Y.
MacLean Publishing Co. ..... Toronto, Ont., Can.
MacLeod Co. ..... Cincinnati, Ohio.
Malleable Iron Fittings Co. ..... Branford, Conn.
Mechanical Appliance Co. ..... Milwaukee, Wis.
Menefee Foundry Co. ..... Fort Wayne, Ind.
Metal Industry, The ..... New York, N. Y.
Metal & Thermit Corp. ..... New York, N. Y.
Michigan Smelting & Refining Co. ..... Detroit, Mich.
Mills, Rhines, Bellman & Nordhoff ..... Toledo, Ohio
Modern Pouring Device Co. ..... Pt. Wash., Wis.
Moline Iron Works ..... Moline, Ill.
Monarch Engineering & Mfg. Co. ..... Baltimore, Md.
National Engineering Co. ..... Chicago, Ill.
Wm. H. Nicholls Co., Ind. ..... Brooklyn, N. Y.
Norma Company of America ..... Long Island, N. Y.
Northern Blower Co. ..... Cleveland, Ohio
S. Obermayer Co. ..... Chicago, Ill.
Ohio Body & Blower Co. ..... Cleveland, Ohio
George Oldham & Sons Co. ..... Baltimore, Md.
Osborn Manufacturing Co. ..... Cleveland, Ohio
Oxweld Acetylene Co. ..... Newark, N. J.
Pangborn Corporation ..... Hagerstown, Md.
J. W. Paxson Co. ..... Philadelphia, Pa.
Penton Publishing Co. ..... Cleveland, Ohio
Charles E. Pettinos ..... New York, N. Y.
Geo. F. Pettinos ..... Philadelphia, Pa.
Pickands, Brown & Co. ..... Chicago, Ill.
Pittsburgh Electric Furnace Corp. ..... Pittsburgh, Pa.
Porcelain Enamel & Mfg. Co. ..... Baltimore, Md.
Portage Silica Co. ..... Youngstown, Ohio
Henry E. Pridmore, Inc. ..... Chicago, Ill.
Racine Tool & Machine Co. ..... Racine, Wis.
Richards-Wilcox Mfg. Co. ..... Aurora, Ill.
Rogers, Brown & Co. ..... Cincinnati, Ohio
P. H. & F. M. Roots Co. ..... Connersville, Ind.
Royer Foundry & Machine Co. ..... Wilkes-Barre, Pa.
Sabin Machine Co. ..... Cleveland, Ohio
Safety Equipment Service Co. ..... Cleveland, Ohio
Shepard Electric Crane & Hoist Co. ..... Montour Falls, N. Y.
Simonds Mfg. Co. ..... Fitchburg, Mass.
Skinner Bros. Mfg. Co., Inc. ..... St. Louis, Mo.
W. W. Sly Mfg. Co. ..... Cleveland, Ohio
Werner G. Smith Co. ..... Cleveland, Ohio
Spencer Turbine Co. ..... Hartford, Conn.
Sterling Wheelbarrow Co. ..... West Allis, Wis.
W. F. Stodder ..... Syracuse, N. Y.
Sullivan Machinery Co. ..... Chicago, Ill.
Superarc Welding Machine Co. ..... Detroit, Mich.
Syracuse Supply Co. ..... Syracuse, N. Y.
Tabor Mfg. Co. ..... Philadelphia, Pa.
W. P. Taylor Co. ..... Buffalo, N. Y.
Taylor Instrument Cos. ..... Rochester, N. Y.
Truscon Steel Co. ..... Youngstown, Ohio
United Compound Co. ..... Buffalo, N. Y.
United States Graphite Co. ..... Saginaw, Mich.
United States Silica Co. ..... Chicago, Ill.
Vibrating Machinery Co. ..... Chicago, Ill.
Wadsworth Core Machine & Equipment Co. .. Akron, Ohio
H. L. Wadsworth ..... Cleveland, O.
J. D. Wallace & Co. ..... Chicago, Ill.
Wayne Oil Tank & Pump Co. ..... Fort Wayne, Ind.
Westinghouse Electric & Mfg. Co. ..... East Pittsburgh, Pa.
Westinghouse Traction Brake Co. ..... Pittsburgh, Pa.
White & Bro., Inc. ..... Philadelphia, Pa.
Whitehead Bros. Co. ..... Buffalo, N. Y.
Whiting Corporation ..... Harvey, Ill.
E. J. Woodison Co. ..... Detroit, Mich.
T. B. Wood's Sons Co. ..... Chambersburg, Pa.
Young Bros. Co. ..... Detroit, Mich.

Descriptions of some of the exhibits are given on page 190 of this issue.

Spotted Rolled Copper Sheets

Q.—1. Cold rolled copper sheets, when finished, show light spots of various sizes and shapes under the surface, that appear as though the cold rolls did not cover the surface evenly.

A 30 in. by 96 in., 16 oz. sheet receives the following operations. The piece from which this sheet is rolled is .170 in. thick. All the scale is cleaned off the piece. It is then heated to a cherry red, taken out of furnace, swept off with broom, rolled in packs of 4 and 5 sheets to about 60 in. long in about 9 passes, depending on the condition of the rolls, pack is folded over end to end and placed back in furnace, reheated, then run out to 102 in. (rolled in oil to 60 in. and without to 102 in.). The sheets are then bagged in Rockwell furnace at 1,300 degrees, E, for 1½ hours, then placed in water, then sheared, cleaned and cold rolled in packs of 2 and 3 each. The sheets are sheared to 96 in. before cold rolling, then rolled to 100 in.

The sheet you will note receives 4 in. of cold rolling.

The spots disappear entirely from the sheet when given 8 in. of cold rolling, but are very hard and snap off in the jaws of the leveler. The heavier the sheet, the fewer the spots. Sheets given 6 in. of cold rolling and then bagged, cleaned and given an additional 4 in. of cold rolling do not have these spots.

2. Is there any set rule for rolling copper, or in other words if a 30 in. by 96 in., 16 oz. sheet receives 4 in. of cold rolling (after being annealed) would it be logical to give a 30 in. by 96 in., 10 oz. sheet (which is 40 per cent lighter in gauge) 4 in. of cold rolling?

A.—1. The cause of your trouble is undoubtedly scale. We believe that if you will cut down your heating temperature from 1,300 deg. Fahr. to from 1,050 to 1,150 deg. Fahr., that you will make much less scale and consequently eliminate the spots that you are troubled with. You would also have less scale if you rolled your cake to say .090, in the first heat. You can then eliminate one heating with its attendant scale, and only have to heat once to get the pack to 16 oz. For your second rolling 1,000 deg. Fahr. will be sufficient. The reason your heavier sheets do not show so many spots is because you probably only heat once to roll to finished gauge.

Pickling and cleaning must be done carefully and thoroughly or scale will be left which causes the spots because the rolls will not hit the bottom of the depressions where the scale lies.

2. There is no set rule. It is better to make sufficient allowance to avoid cracking in of the edges, for as you realize the thinner the sheet the more cost it represents in labor. W. J. Pettis.

Brass Foundry Equipment

A List of Materials and Supplies Required for a Brass Foundry Melting Five Tons of Metal per Day

Written for The Metal Industry by WILLIAM H. PARRY, Foundryman

This list of materials, equipment and men needed for the successful operation of a 5-ton brass foundry can be dealt with under five heads, viz.: cleaning room, dipping room, foundry, pattern shop, and tumbling or sand blasting room.

The law in most of our states prohibits cleaning and dipping departments being included in the foundry proper. While there is no law prohibiting the inclusion of the pattern shop as part of a foundry, it is obvious that it cannot be so included, for the reason that it is impossible to coax pattern makers to work under such conditions.

CLEANING ROOM

The cleaning room should be equipped thus: 5 grinding lathes (double enders) all of them piped to exhauster system overhead and pit; 2 band saws; 1 sprue cutter, 50 abrasive wheels of various grits, diameters and face widths; 5 chippers, vises and bench long enough to fasten them to; 1 chipping hammer (air operated); 200 files, such as rat-tail, bastard, brass cut, etc., 3 hack saw frames; 2 gross of hack saw blades; 24 cold chisels, 1 dozen hand hammers, 1 to 4 lbs.; 2 pinch bars; 1 air hoist; 24 band saw blades, ½ and ⅝ inch widths; 1 band saw filing machine; 1 band saw setting machine; 1 band saw brazing outfit; 10 lbs. of brass solder; 4 barrows; 1 hand truck; 4 buggies; 2 rolls each of leather belting 3 inches, 3½ inches, and 4 inches wide.

The men required are four grinder operators, 5 chippers, 2 band sawyers and brazers, and two helpers.

DIPPING ROOM

Twelve carboys of dipping acid, such as sulphuric and nitric; two containers of hydrofluoric acid; 1 acid pump; 2 carboy cradles; 1 hot water supply system; 6 half barrels or round wooden tanks; 3 crocks (round) 18″ x 18″; 6 dipping baskets; 6 earthenware hand crocks or pitchers for use on any acid but hydrofluoric; 6 hoods of wood over acid dips; 1 exhausting system, wood-lined; 1 Red Cross outfit; 1 barrel of salt; 4 cypress tanks 3 ft. x 20 inches deep x 8 ft. long; 12 pairs of tongs (hand); 12 pokers; 6 pairs of rubber gloves; 6 rubber aprons; 6 pairs of wood-soled shoes; 12 respirators; 6 pairs of rubber boots. The men required are 1 dipper and 2 helpers.

FOUNDRY

Sixty tons of molding sand; 5 tons of core sand; one electric furnace, or 2 Schwartz, open-flame 42″ furnace, or a battery of 12 to 16 pit furnaces, coke or oil fired, and big enough for No. 100 crucibles; the necessary wiring, terminals and switchboard for the electric furnace; oil tank storage and pumps for the Schwartz, and oil pits and 2 carloads of coke, at least, for the coke-fired pits; 1,600 gallons fuel-oil; 2 fuel-oil pumps; 3 positive-pressure blowers, motor-driven; 1 motor-driven air-compressor, capacity of 150 to 200 cubic feet of free air per minute; 200 ft. of air hose; 24 hand bellows; 4 air hoists; 6 molders' benches, vibrator equipped (not tubs). No belting in this foundry. Twelve brooms; 2 blowout tanks; 250 bottom boards to fit various flask sizes; 24 blow guns, 2 barrels of blacking (graphite or plumbago); 12 buckets; 12 coal hods; 1 overhead trolley or conveyor system; 4 core ovens (1 large, 2 medium, 1 small); 6 barrels of core-oil (linseed preferred), or 6 barrels of flour; 2 barrels of molasses; 1 rockover core machine; 4 core racks; 8 core-makers' benches; 12 core-makers' tongs; 100 core plates of assorted sizes; 1 small travelling crane for floor work, or the air hoists will do in conjunction with over head tramrail; 4 crucible tongs, if pit furnaces are used; 1 centrifugal facing mill; 6 barrels of sea-coal facing; at least one set of fire brick linings in storage for every furnace used in addition to at least 500 standard fire-brick for repairing core ovens, etc.; 6 barrels of fire clay; 6 barrels of fire sand such as carborundum; 2 barrels of silicate of soda (water glass); 1 dozen fire extinguishers; 48 snap flasks of assorted sizes, preferably of the tapered kind; 300 bands or slip jackets; 200 flask weights; 400 tight iron flasks of assorted sizes; 500 lbs. of phosphor copper (15 per cent); 200 gaggers of assorted sized for floor work only; 24 hand riddles; 6 gyratory sand riddles, electrically driven; 24 hand ladles, 60 to 250 pound capacity; 2 ladle heaters; 1 barrel of parting compound 2 pyrometers; 24 pairs of hand rammers (butt and pene); 2 floor rammers, of iron (butt and pene); 24 shovels; 6 spray guns; 12 molding machines, such as hand and power squeezers, rockovers (plain), and jar ram, all of bench mold capacity; 6 wheelbarrows; 6 buggies; 50 pounds of nails of all sizes from 4 penny to 20 penny in size. As brass chaplets are not on the market, they are usually home-made; 24 vibrators; at least 3 complete sets of furnace tools, such as poke bars, hoes, slice bars, tongs of various lengths, skimmers, slag breakers, rakes. Brushes of all kinds are used in a foundry such as pattern cleaning, camels' hair, swabs, core painting, etc.

The core-room must be equipped with rapping mallets (rawhide and wood), hammers, dividers, calipers, rules (standard and shrink), core wire, nails, 1 core wire straightener (power driven), clamps of all kinds and sizes, say 25 all told.

The foundry will use 50 clamps, adjustable and otherwise; 200 hardwood wedges; 4 rapping bars; 1 pair of snips; 3 gasoline torches. The pattern storage room should be lined with racks, preferably of steel. As this foundry must use copper, tin, zinc, and lead, it is well to have on hand at least 10 days supply (20 would be better), and assuming that it is a red brass outfit, and the firm back of it has sufficient capital, it follows that 85,000 lbs. of copper, 5,000 lbs. of tin, 6,000 lbs. of zinc (to make up for chimney losses) and 5,000 lbs. of lead are needed for a start in addition to small lots of phosphor copper, antimony, bismuth, and aluminum for special jobs.

Scrap copper, brass, tin, lead and spelter in quantities to suit the pocketbooks of the foundry owners should be included as part of any brass foundry outfit.

One heating system, arranged so as to act as a ventilating and cooling plant in hot weather. Foundry buildings are so designed today as to provide all the ventilation necessary summer and winter.

As the floor pouring racks are home-made because they are not on the market, they are not included here. Scrap-baling machines are not included in foundry outfits universally. The work is accomplished with a pestle and mortar, hand operated. If the scrap is bought properly no baling is needed, except, perhaps, to mass the punch-

ings and other small material formed in some other portion of the plant.

Men required are four to six bench molders; eight to ten molding machine operators; four to six coremakers; three to six melters, and six to nine helpers and pourers.

PATTERN SHOP

One 36 inch band sawing machine and 12 band saw blades ¼ to ½ in. in width; 1 circular sawing machine; four 14" to 16" circular saws, cross and rip; 1 thickness planer; 1 jointed 12" to 16"; 1 face lathe; 1 bed lathe 24" swing; 1 speed lathe 10" swing; 1 sander 16 inches to 18 inches; 1 drill press; 1 milling machine (universal); 1 dental engine; 1 engine gap lathe 18 inches to 30 inches swing; 1 filing machine; 1 grindstone; 1 emery grinder (universal); 1 soldering-bench furnace; 4 cabinetmakers' benches and workboards; 1 surface plate 24" x 36" of gray iron; 1 lumber storage rack for 25,000 feet of pattern pine (uppers, selects and fine common), 1, 1½, 2 and 3 inch thicknesses; 500 feet of mahogany 1, 1½, and 2 inch thicknesses; 2 quires each of No. 0, 1, 1½, and 2 sand paper; 1 roll of garnet paper; 1 bundle each of ¼, ⅜, ½ and ¾" wood dowels; 1 gluepot (vacuum and steamfitted, or electrical); 2 gross of every size of wood screw from ⅜ in to 3 inches in length and in suitable diameters making about 100 gross altogether; all sizes of wire nails from ⅜ in. to 4" in length, and making about 100 pounds altogether; 1 barrel of glue (superfine); 10 pounds of corrugated fasteners; 1 barrel of shellac varnish; 1 barrel of denatured alcohol; 10 pounds of lamp black; 5 lbs. of dry vermilion; 20 gross of machine screws, brass and steel; 4 patternmakers' vises; 2 machinists' vises; 2 complete alphabets of pattern letters of ¼, ⅜ and ½ inch sizes, sharp faced gothic; wood and metal lathe tools of all kinds; 1 set each of knives for jointer and thickness planer; 3 soldering irons; 10 lbs. of solder; 2 brooms; 8 steel shrink rules 1/16, 1/12, 1/10, 1/8, 3/16, 1/4, 5/16 and 3/8 inch contraction; 100 feet of the following sizes of leather fillets: 1/8, 3/16, 1/4, 5/16, 3/8, 1/2 inch, and fifty feet of ⅝ and ¾ inch sizes; 50 feet of wood fillets ½, ¾ and 1 inch sizes; 1 roll each of wax fillets (ozokerite), ¼, ⅜, and ½ inch sizes; 1 set of ball end wax irons; 3 varnish cans; 8 drawing boards of assorted sizes; 1 surface gauge; 1 bar calipers; 1 to 24 fast-joint calipers; 1 set of ellipsographs; 1 set of transfer calipers; 1 set of trammels; 1 set of straightedges (steel) 12 inches, 24 inches and 36 inches long; 6 varnish brushes; 2 marking or artists' brushes; 1 gross of lead pencils from 2H to 6H; 1 roll each of 2 inch, 2½ inch, 3 inch and 4 inch leather belting; 1 gross of thumb tacks.

Men required are two or three wood patternmakers, 2 or 3 metal patternmakers and 1 apprentice.

TUMBLING ROOM AND SAND BLASTING ROOM

Four horizontal and 2 open end (Globe or Baird) wet tumbling barrels; 1 magnetic separator; 1 cinder crusher; 1 sand blast table; 1 sand blast barrel machine; 4 wheelbarrows; 1 hand truck; 2 buggies; 24 tumbling or crusher weights (cast iron); 1 ton of tumbling stars (cast iron); 1 cold water system, piped to all tumblers and crushers; 2 concentrator tables; 6 water buckets; 4 coal hods; 12 tongs of various shapes and lengths; 1 clock; 3 rolls each of 3, 3½ and 4 inch belting (waterproof); 200 feet of belt lacing, either leather or brass; 1 belt lacing outfit; 4 pairs of rubber boots; 4 rubber aprons.

Four men will be needed.

HOT GALVANIZING AND TINNING EQUIPMENT

My article on "Hot Tinning," published in THE METAL INDUSTRY for October, 1921, page 400, covers this insofar as hot tinning is concerned; just add a galvanizing kettle and sal ammoniac in cask lots and the list will be pretty nearly correct.

It is understood, of course, that each of these departments is equipped with its own motor or generator in addition to the several units, motor driven.

ALPHABETICAL LIST OF SUPPLIES

Tonnage produced annually, 3,000,000 to 3,500,000 lbs.

Kind of products, brass castings.

Number of employees, hand molders, machine molders, core makers, pattern makers, etc., 50 to 60 men classified as shown above.

Abrasive Wheels
Acids and Chemicals
Air Compressors
Air Hoists
Air Hose
Aprons
Bellows
Belting
Benches
Blacking
Blowers and Ventilating Systems
Blowguns
Blowout Tanks
Boots
Bottomboards
Brooms
Brushes
Buckets
Buggies
Calipers
Carboy Cradles
Cinder Crushers
Clamps
Clock
Coal hods
Coke
Cold Chisels
Concentrators
Conveyors
Conveyor Systems
Core Machines
Core Oils and Binder
Core Ovens
Core Plates
Core Racks
Core Sand
Cranes
Crucible Tongs
Dipping Baskets
Dividers
Emery and Carborundum, etc.
Exhausters
Facing Mill
Facings
Fans
Files
Fillets
Fire Brick and Clay
Fire Cement
Fire Protection Systems
Fire Sand
Flasks, Snap and Tight
Flack Weights
Flour
Fluxes
Fuel Oil
Furnace Tools
Furnaces—Gas, Pit, Tilting, etc.
Gaggers
Gloves
Graphite
Grinding Lathes
Grinders
Guns (Spray)
Hack Saws
Hammers
Hand Brushes
Hand Riddles
Hot Supply System
Hot Galvanizind and Tinning Equipment
Jackets
Ladles
Lindseed Oil
Magnetic Separators
Mallets
Molasses
Molding Machines
Molding Sand
Nails
Ovens
Overhead Trolleys
Parting Compounds
Pattern Lumber
Pattern Racks
Pattern Shop Machinery—Saws, Planers, etc.
Pickling Tanks
Pinch Bars
Pitchers
Pneumatic Chippers
Pokers
Pouring Racks
Pumps
Pyrometers
Rammers
Respirators
Rubber Boots and Aprons
Salt
Sand Blasts
Sand Mixer
Sand Sifters, Electric
Separators
Shoes
Shovels
Sodium Silicate
Solder
Sprayers
Sprue Cutters
Squeezers
Tacks
Tongs
Trucks
Tumbling Barrels
Tumbling Stars
Vibrators
Vises
Water Hose
Wedges
Wheelbarrows
Wire Straighteners

Some Foundry Problems

Some Difficulties and Their Solutions

Written for The Metal Industry by WILLIAM J. REARDON, Foundry Editor

Aluminum Bronze

Q.—What is the usual formula for aluminum bronze when making it for test work?

Would you consider it an advisable metal for organic acid work, to be made in the form of a kettle 36" inside diameter by 4' long? This kettle to stand a 500 pound pressure test. Castings are not to be machined except on the face of flange and face of hole on the bottom.

A.—The usual formula for aluminum bronze, when making it for test work, consists of 87.50 copper, 7.50 aluminum, 3 iron, and 2 ferro-manganese. It requires special skill to make successful castings to stand a 500 pound pressure. Nevertheless, it can be done by most any foundry that will forget for the moment what they know about casting other bronze castings and metal.

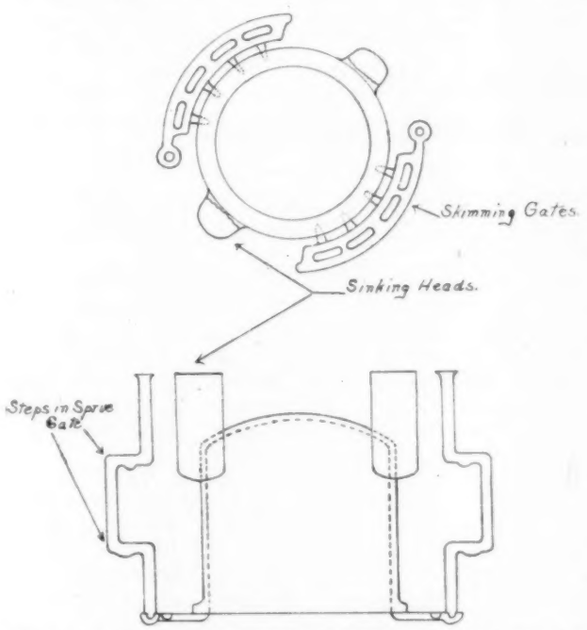


FIG. 1. METHOD OF GATING ALUMINUM BRONZE KETTLE.

In molding, it is necessary to have the metal enter the mold with the least agitation. I would suggest in your case to gate as per sketch. Handle your metal as follows: Place the iron in the bottom of the crucible in the form of clean tin plate with small amount of charcoal. Place the copper on the top of the iron. When the copper is melted, add 2 pounds of ferro manganese as a flux. Keep all other flux away from the metal. Then add the aluminum a little at a time. Stir well. Remove the metal from the furnace; pour into ingots, and remelt under charcoal for the casting.

Air-Chucks

Q.—I am sending you under separate cover, a couple of castings and would like to know what you think is wrong with them.

We manufacture air chucks which have to stand 150 lbs. air pressure. The castings look good on the outside, but when machined up and tested, they leak. The trouble seems to run in streaks, that is, we will cast five or six thousand and they test O. K. The next run might go half bad. The metal we use is yellow brass rod borings, nothing else. We melt them in a U. S. oil-fired rotating and tilting furnace. Pouring them first into ingots, then we use equal parts of ingots, gates, and our own scrap, which of course is made from those yellow brass borings. We use 4 lbs. of soda ash to 200 lbs. of metal, for a flux. We add about 3 oz. of phosphor-copper, just before pouring, as a deoxidizer. As near as I can tell we use a natural flame, neither oxidizing nor reducing. We pour it at about 2,200 degrees F. Now I would like to ask a few questions.

FIRST. Can air-tight castings be made out of those borings without first pouring it into ingots? That is, to be 90% good?

SECOND. Can they be made air tight out of those ingots mixed with gates and scrap?

THIRD. Will a trace of antimony in the metal make them leak?

We use Albany No. 1 sand, a little on the dry side rammed loose. We never use hot sand.

A.—The sample seems to be very badly segregated, which is probably due to lack of feeding. Your mixture is high in zinc, and low in lead and tin, and requires feeding. From the looks of the castings, I conclude that it is gated as per sketch No. 3. I would suggest that you change the gate, so that the casting will be gated as per sketch No. 2.

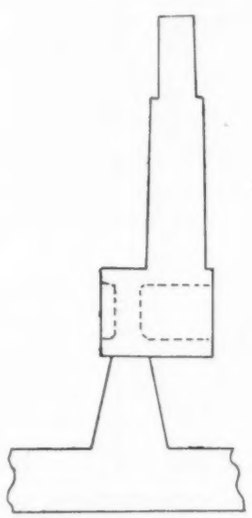


FIG. 2. CORRECT GATING FOR AIR CHUCK.

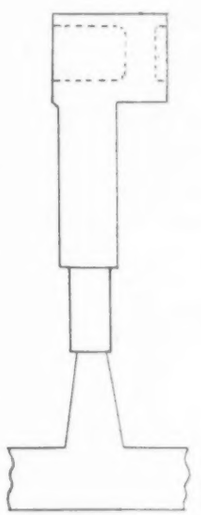


FIG. 3. INCORRECT GATING FOR AIR CHUCK.

Question No. 1.—Can air-tight castings be made from those borings without first pouring it into ingots, to be 90% good? It can be done. If poured into ingots, it would run 90% good. I would suggest to melt the metal as follows: Take half-gates and half-borings; charge the gates into the furnace, then the borings, after which use a flux made up of two pounds of a mixture consisting of five parts lime, one part fluorspar, and one part sand. To each of one hundred pounds of metal charged, when the metal is melted, add three ounces of phosphor-copper; use five pounds of lead to each one hundred pounds of borings charged, and one pound of tin.

Question No. 2.—Can they be made air tight out of

those ingots mixed with gates and scrap? Yes, but however, it is more expensive than the first method.

Question No. 3.—Will a trace of antimony in the metal make them leak? Antimony in air tight metal is as detrimental as aluminum. There will be a large percentage of leakage in your casting when either antimony or aluminum is used. No. 2 Albany sand is better to use than No. 1 in this class of work.

Removing Sand from Castings

Q.—Will you kindly advise us how we can remove sand from castings. This sand adheres to casting from grinding plug to barrel and we would like something to remove it from threads and to make castings bright. We have no plating plant and would to have a mixture where we could dip them and remove the sand.

A.—Sand can be removed by immersing the castings in an acid composed of 1 gallon of water and 1 quart of hydrofluoric acid, heated to 160 deg. Fahr. The heating can be done by lead steam-coils, as the acid will dissolve glass and silica. The container should be wood, lead-lined with burned-in seams, as solder seams will not last long. After immersion of ½ to 1 hour the sand will be removed. The castings should then be drained well, and washed thoroughly in running water to remove loose sand. Then prepare a bright dip as follows:

Nitric Acid	1 Gallon
Sulphuric Acid	1 "
Water	1 Quart
Muriatic Acid	2 Ounces

Let this mixture stand over night before using. Then dip in the bright dip; afterwards in cold water. Then rinse in hot water.

If the castings are small, the hydrofluoric dip may be omitted. Use a regular water tumbling barrel, and use about 2 ounces of washing soda per gallon. This will remove the sand by friction. Then dip in the bright dip.

Casting Copper Without a Riser

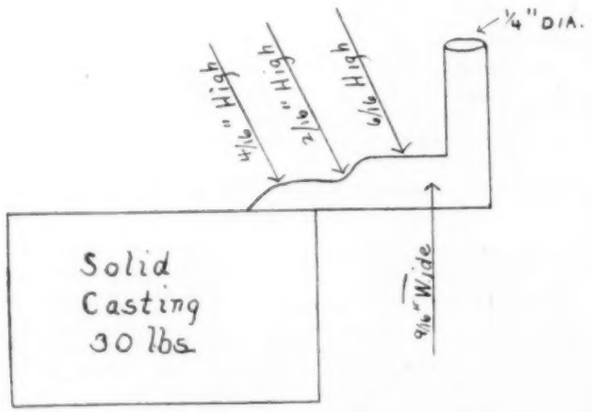
A Description of a Method of Casting Copper Which Saves Metal and Labor

Written for The Metal Industry by NELSON F. FLANAGAN, Foundry Foreman

Back in 1916 I was foreman of a copper foundry. We had a superintendent who thought he knew all about casting copper in sand and we were trying to cast 8", 9.2" and 10" copper bands in sand under his supervision. He used the ordinary method of agate and riser.

At first the riser was not large enough, and finally he had a swirl gate and riser that suited him, but it seems that we always had trouble. The metal was too cold, or under-poled, or over-poled, not enough nickel, or too much (some of the bands called for 2% nickel). Finally the concern went into the hands of a receiver.

The last few days of casting the bands in sand, they let me try out my pet idea of a small gate weighing 1¾ lbs., without using either riser or chills. To every one's surprise it was a success. The bands cast with this gate were clean and solid and showed no variation in weight from the bands cast with a riser. They were put on a



METHOD OF CASTING PURE COPPER.

lathe and turned down to a very thin shell; in fact they were put to every test, and were the equal of the bands cast with a riser in every way.

We poled the copper till we brought it where we wanted it, which was a good, tough pitch. Then we poured the copper at about 2500° F., or just hot enough so that the head would not swell. We put about 6 oz. of 15% phos. copper in the bottom of a ladle holding about 100 lbs. copper.

When the castings were cool enough the molds were shaken out and the gate easily broken off at the choke, leaving only the small end of the gate to be sawed off. I have had 300 molds in 9 hours from a pair of Nicholls moulding machines, and 500 molds per 9 hours from 3 of the same machines (one machine making the drags and the other two machines making the copes), with men who never knew what a mold was.

While working for the George Clark Metal Production Company, Detroit, Mich., as foundry superintendent, I made about 20 castings of Cu. 98-Ni.2 with this gate in sand, without risers or chills for the Packard auto concern in Detroit. And they said the castings were solid and very satisfactory. In fact, they wanted us to make more castings for them, but as we were casting copper bands 14" and 16" in centrifugal casting machines, Mr. Clark thought we did not have the time to bother with them. In fact the Packard people had to furnish the sand, flasks, etc., as we were not equipped for sand casting. I do not claim that this gate will produce good solid castings from copper and other metals that are not properly melted, but if good copper or a poor grade of copper is poled to proper pitch, and poured at right temperature, a casting can be made with it that is just as solid as one cast with a riser. Thus not only saving a large amount of metal, but also the cutting off of the risers and the grinding.

But the centrifugal casting has it beat as they have neither gate or risers.

Furnace Gases and Aluminum

The purpose of a study being made by the Bureau of Mines of Pittsburgh, Pa., is to examine the effects, and interactions of the various gas constituents found in furnace atmospheres, e. g., carbon dioxide, carbon monoxide, oxygen, sulphur dioxide, water vapor, nitrogen, etc., upon aluminum at various temperatures. The available information, based on the literature, as to the possible effects of various gases on aluminum at various temperatures has been obtained. Laboratory experiments are to be carried out.

New Aluminum-Silicon Alloys

A Description of "Aladar," "Aludur" and "Silumin," All Alloys of Aluminum and Silicon, and Their Origin

Written for The Metal Industry by R. E. SEARCH, Exchange Editor

For a number of years investigations have been conducted in various laboratories by the most skilful of metallurgists, both here and abroad as to how the physical properties of the well-known light aluminum alloys might be improved. Many experiments have been undertaken to build up their resistance to rupture, both at normal temperatures up to 250 deg. C. and beyond. For example, Dr. Rosenhain has found that an aluminum alloy with 4% Cu, 2% Ni, and 1.5% Mg, at the ordinary temperature has a resistance to rupture of no more than 10.5 Kg per square millimeter, while at a temperature of 250 deg. C. this property is reduced only to 9.1 Kg per square millimeter. But even these figures can be bettered by the proper heat treatment. The efforts made to increase the tensile strength of these alloys have succeeded, but generally they have been accompanied by a corresponding loss in their elongations.

At one time the zinc-aluminum alloys gave the greatest promise of success, but subsequent investigations proved that aging did them no good, and that if held in storage for some time they season-cracked or showed strong tendencies to disintegration. The writer at one time made some small so-called propeller wheels, for the castings were in that form, of a good 15% zinc-aluminum alloy, using the best horsehead zinc and the best aluminum that could be obtained. These little castings, not more than 1½ in. in diameter, were used as stirring devices in some laboratory experiments. In the course of a very short time, they cracked at the junction of the little blades with the stem, and even the blades themselves cracked, so that the use of the alloy for that purpose had to be abandoned.

Although it has been found with most of the light aluminum alloys that when heated to 250 deg. C. or slightly beyond, their tensile strength dropped to an alarmingly low figure, it was found, however, afterwards that a small percentage of nickel or manganese increased this resistence to the destructive action of heat and also improved their elongation.

During all this intermediate time efforts were made to so purify aluminum itself as to eliminate the last trace of silicon, which seemed to be the most offending impurity, and the most difficult to get rid of. The use of cerium in small amounts was taken up to expel the silicon, or if that were impossible to nullify its reaction upon the physical properties of the aluminum, for it was known that the purer the aluminum, the greater was its elongation. And now, strange to say, having almost abandoned the struggle to free aluminum from its most contaminating impurity, silicon, the metallurgists and foundrymen have gone to the other extreme, and have deliberately added silicon, in heroic doses, to increase the hardness of the alloy and also its tenacity. Up to the present time, however, no one has found the open sesame to the magic property of elongation, with which to endow the new alloy with a long life of prosperity and usefulness. No one has been able yet to make an alloy of aluminum that will equal aluminum itself in its high percentage of elongation, i. e., 15% or beyond, either by the addition of any known new element, or by any process of heat treatment or of aging, such as have helped the best of all known aluminum alloys, the magic Duralumin.

The new alloy of aluminum was discovered and patented by Aladar Pacz, of Cleveland Heights, Ohio. It was patented in France on the 30th of August, 1920, and on the 22nd of August, 1921; and on the 18th of March 1921, in England; and in 1921 by the U. S. Patent No. 1387900. His various patents covered the alloys of aluminum and silicon from 5 to 20% of silicon, balance of aluminum, with not over 2% of other metals as impurities, including iron or boron not to exceed one half of one per cent.

It is claimed in several German periodicals that this same new alloy (which they designate as "Silumin," but which in all justice to Mr. Pacz's discovery and patents should be hereafter called and known by all metallurgists as "Aladar," in his honor) was first exhibited publicly in September, 1921, at an automobile exhibition held at Berlin. At present I have no facts at hand to refute this claim. They claim that the alloy is the result of some investigations that were carried out in the laboratories of the Metal Bank and Metallurgical Society, A. G. of Frankfort, A. M. A search of the patent office records of France, England, Germany, Austria and the United States failed to reveal the name of any one individual or company, other than Mr. Pacz, who has taken out a patent on "Silumin" or on any other aluminum alloy containing silicon as an appreciable or essential ingredient or constituent of a workable aluminum alloy.

To be as tolerant as possible, it is a strange circumstance if this alloy originated in Germany, that for some inexplicable reason it was not patented in Germany or Austria, either by any German or even by Mr. Pacz himself, but the dates of his patents in other countries at once establish his right of priority to and discovery of this alloy. It is admitted freely, however, that the German metallurgists should have the credit of developing the alloy and introducing it commercially and also of making known publicly its physical properties so far as they have investigated them.

In the description of the alloy given by Mr. Czochralski in the November number of the Zeitschrift fur Metallkunde, 1921, a great deal of camouflage was thrown about the ennobling treatment that had to be given the alloy in the process of making and melting the alloy before it could be used commercially; that its grain originally as made was coarse and that its texture had to be refined so as to give it a finer grain and to increase its ductility. All of these suggestions fall to the ground the moment one reads either the French or English description given by Mr. Pacz in his instructions in his patents as to how the metals should be mixed in making the alloy (see his French patent No. 523665 or the English patent No. 160426 of the 18th of March, 1921). In these patents he sets forth that he first makes a hardener of one part of silicon to four parts of aluminum, and then adds the rest of the aluminum to the charge. The better way to make the alloy would be to make the hardener as he suggested previously, melt the required amount of aluminum and add the proportion of the hardener to the molten aluminum so as to introduce into it the required or desired amount of silicon. That would be in accordance with the best American foundry practice.

In making the melt he treats the charge with a mixture of the double fluorides of sodium and calcium, or of other alkaline metals, using about 1½ and not less than 1% of

the flux to the charge. Any of the other alkaline fluorides may be used as a flux, the object of the flux being to remove any uncombined silicon, iron or alumina or any other earthy metals in an oxidized state that will form fluorides in the molten condition, thus freeing the alloy from all suspended oxides and other earthy matters. The fluxes are said to exert a catalyzing action on the impurities and to aid in refining the grain or texture of the metal product.

In making this alloy it should not be overlooked that the fluoride fluxes are very corrosive and have a great affinity for the silica that is found in all plumbago crucibles. This corrosive action may be overcome to a great extent by coating the crucible with a wash of pulverized alundun put on with just enough water solution to make a paste of the alundun powder; first dry in the air, and then bake it in to the texture of the crucible at a high temperature.

Aladar metal or Silumin, as the Germans call it, is known in England as "Aludur" metal, and contains anywhere from 5 to 14% of silicon; the balance may be aluminum, including not over two per cent of any other metals.

While the alloy in the ordinary foundry practice is usually made in a crucible furnace it can also be made on a large scale electrolytically in the same manner as aluminum itself is obtained.

PHYSICAL PROPERTIES

The specific gravity of the new alloy varies from 2.5 to 2.65 according to the proportion of silicon which it contains; it is somewhat less than the best of the other light aluminum alloys. Its resistance to rupture amounts to from 18 to 23 kilograms per square millimeter, or an average of about 28,000 pounds per square inch, which is about equal to the well known American alloy of 95% Al, 3% Cu, 1% Mn and 1% Mg. (See Technologic Paper No. 139 of the Bureau of Standards, Washington, D. C.). The tenacity decreases with a rising temperature, at first slowly, then somewhat more rapidly. The elongation of cast Aladar metal is from 5 to 10%, the copper (8% Cu), aluminum-alloy from 1 to 4%, the zinc-aluminum alloy (Zn, 10%, with 2% Cu) from 2 to 4 per cent. The composition of the various alloys are compared in the tables and the diagrams with the physical properties of Aladar metal so that the reader can get a better grasp of its value as an alloy relative to the three best known light aluminum alloys. See the diagrams below.

The copper-aluminum alloy is well known in Germany and is designated by the German metallurgists and in their literature as the "American Alloy." The zinc-aluminum alloy of the composition as just mentioned is equally known and designated by them as the "German Alloy," but for the sake of clearness they will be designated in this text as respectively the Cu-Al-alloy and the Zn-Al-alloy.

At room temperature, with a load of 500 kilograms and a ball of 10 millimeters diameter the hardness of Aladar amounts to 60 kilograms per square millimeter; at 350 deg. C. it drops to 20 or 25 kilograms per square millimeter. Dilute nitric acid (25%) as well as the concentrated acid attack it less severely than they do pure aluminum. The other mineral acids and the alkalies corrode it about the same as they do pure aluminum. It is a better conductor of heat than the other known cast light aluminum alloys. With pure aluminum it compares as 4

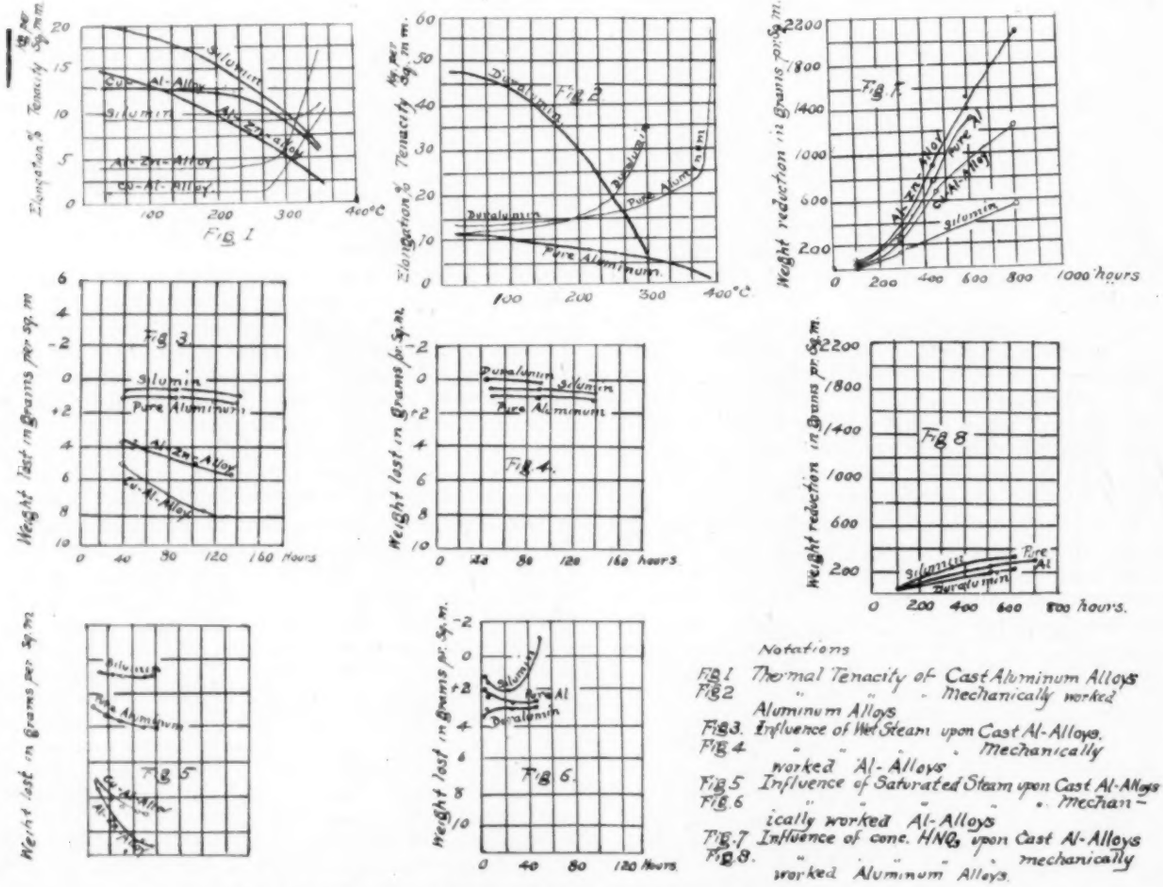


Fig 1
Fig 2
Fig 3
Fig 4.
Fig 5
Fig 6.
Fig 7
Fig 8
Notations
Fig 1 Thermal Tenacity of Cast Aluminum Alloys
Fig 2 " " " Mechanically worked Aluminum Alloys
Fig 3. Influence of Wet Steam upon Cast Al-Alloys.
Fig 4 " " " Mechanically worked Al-Alloys
Fig 5 Influence of Saturated Steam upon Cast Al-Alloys
Fig 6 " " " " Mechanically worked Al-Alloys
Fig 7 Influence of conc. HNO3 upon Cast Al-Alloys
Fig 8. " " " " Mechanically worked Aluminum Alloys.

CHARTS COMPARING PROPERTIES OF VARIOUS ALUMINUM ALLOYS.

is to 4.7. Other cast light aluminum alloys drop to 3.2 or to 3.6.

The torsion angle of the new alloy is about 420 degrees. In the repeated impact (with a working load of 10 cmkg) it submitted to 530 impacts. Coefficients of expansion due to heat are: Pure aluminum, 1; Aladar, 0.88; Cu-Al-Alloy, 0.98; Zn-Cu-Al-Alloy, 1.01.

The torsion capacity of the three alloys disappears as follows: Aladar at 530 deg., Zn-Al-alloy at 340 deg. and the Cu-Al-alloy at 110 deg.

The crystalline structure of Aladar in an untreated state is very coarse, that is, if it is made without the presence of the double fluoride fluxes, but after the metal has been properly melted and mixed, by using the flux as previously mentioned, the physical structure becomes fine-grained and the metal reaches the state of its greatest efficiency so far as our present knowledge goes. If properly treated by being remelted with cerium it might go to unknown heights.

It is quite possible that on account of its low coefficient of expansion due to heat (see table 1) Aladar may supplant all other metals as the alloy to be selected for the manufacture of aluminum pistons in all aero-motors or other high speed motors, not even excepting duralumin, although the latter metal has almost as low a coefficient of expansion as Aladar. But Aladar has a great advantage over its great rival for supremacy by being much easier to cast into sound castings, and also because of its greater resistance to corrosion at fairly high temperatures. A careful study of the tables and the diagrams will reveal a real struggle for the survival of the fittest among these four alloys.

Where one alloy may be the best for one purpose, and another for a different purpose, in order to make a choice, all of them must be studied and compared with each other, step by step.

TABLE 1. PHYSICAL PROPERTIES

Aluminum Alloys	Sp. Gr.	Electrical Conductivity at 20 deg. C. m Ohm per mm²	Coefficent of expansion due to heat	Heat Conductivity Cal. cm.⁻¹ per sec.⁻¹ per deg.⁻¹
Pure aluminum	2.7	33	0.0000251	0.470
Zn-Cu-Al-alloy	2.9 to 2.95	..	0.0000255	0.308
Cu-Al-alloy	2.85 to 2.9	..	0.0000246	0.348
Aladar	2.5 to 2.65	26.5	0.0000222	0.386
Duralumin	2.8	20	0.0000226	.....
Hard drawn electrolytic copper		56	.....	.....

TABLE 2. MECHANICAL-TECHNICAL PROPERTIES.

Aluminum Alloys	Tenacity Kg per sq. mm.	cast Elongation. %	Hardness L. 500 Kg Ball 10 mm diam. Kg pr. sq. mm.	Torsion angle deg.	Mechanically worked Tenacity Kg pr. sq. mm. soft	hard	Elongation. % soft	hard	Hardness 500 Kg ball 10 mm. diam. Kg pr. Sq. mm. soft	hard
Pure Al.	..	..	..	..	10	20	30	5	30	60
Zn-Cu-Al.	12-17	2-4	55	340	20	30	20	10	55	90
Cu-Al.	12-15	1-4	60	110	20	30	20	10	60	90
Aladar	18-23	5-10	60	420	16	30	30	5	60	..
Duralumin	..	..	..	..	38	42	20	15	60	150

Torsion bar mm. long by 18 mm. diameter.

APPLICATIONS

On account of the difficulties met in making castings in sand of duralumin and the lack of knowledge of the best foundry practice about it there can be no doubt that Aladar will supplant the older alloy for many purposes where good sound castings are required. The magnesium always present in duralumin makes it difficult to get castings in that metal free from porosity.

Aladar will be found as an available alloy in all kinds of traffic materials, in parts of motor trucks, bicycle fittings, aeroplane parts, automobile frames, chassis, cylinders, piston heads and rods, housings and casings. It can be used as a substitute for bronze in bushings, door and window frames, fans and other forms of machinery, in balances or scales of all kinds where a non-rusting metal is desirable. On account of its heating conductivity it can be used for compensation plates, coolers, cooling cores or centers; for distillery apparatus, condenser plugs, etc.

As to material for pistons or plungers for steam pumps it is not yet known whether it is susceptible to surface growth and permanent expansion when heated up to 350 deg. C. like most of the light aluminum alloys, but it is advisable to have this knowledge before any attempt is made to use it for pistons for aero-motors or automobiles, or other high-speed piston service. As rapidly as possible engineers should correlate all the practical tests of the new alloy, based on the laboratory tests now known and those yet to come, so as to learn its adaptability for service where its competing light aluminum alloys have failed before they specify it for the purposes for which it is apparently suited.

It is possible that other elements like copper, manganese, nickel or even chromium might be added or even carbon in some soluble form, that will make the metal more uniform, more elastic and develop in it an elongation approaching that of manganese bronze. Or, some of these additions may enable it to retain its best physical properties at higher temperatures than have been obtained up to the present state of our knowledge about the alloy.

In its resistance to corrosion by weak or dilute acids very little has been done and as it would be exposed more to their attack in the usages to which it would naturally be put, it would be desirable to have this information at the earliest possible moment. While the metal resists the action of concentrated nitric acid when in a mechanically worked condition, the conclusion cannot be drawn from this fact that it would resist equally well the attack of dilute mineral acids. In a sand-cast state it fares much better than all of the other alloys with which it is compared, see Fig. 7.

In addition it remains to be shown what its segregation and liquation characteristics are, for upon such phenomena depend its usage for many purposes in a cast state. It is known that the segregation in aluminum-copper alloys with 3.5% copper differs by less than one per cent between the specimens taken from the center of the cast block and that taken from the rim or edge of the same. Not so favorable a result is obtainable in the aluminum-zinc alloys. What the segregation is under the same conditions in Aladar is not yet known; it may be less or more, but if less it would indicate that the metal might be very suitable for certain sorts of bearing metals.

Casting Secondary Aluminum

Study is being made by the Bureau of Mines of the effect of the quality of primary and secondary aluminum pig and aluminum-alloy pig in sand-casting practice as related to the quality of the resultant castings. Preliminary investigation, based on reports from foundries and other sources and on observation, has shown that difficulties are experienced in both foundry practice and in die-casting work owing to variation in the quality of aluminum melting stock. This investigation may be regarded as continuous for the present. Some foundry experiments on the subject are under consideration.

The Metallurgist and the Brass Foundry

A Criticism of Modern Technical Schools in Their Relation to the Metal Industries

Written for The Metal Industry by M. G. KORSUNSKY, Metallurgical Engineer

At various times, the technical press has published articles, defending the metallurgist, or perhaps more often the chemist in the question of his usefulness to the brass industry. Much has been said about the advantages to the foundry and the rolling mill of having a staff of men who can read the picture of the micro and macro-structure, this ability of course, belonging to the really educated metallurgist. Nevertheless, an observer could visit thousands of foundries and dozens of rolling mills, where no metallurgists are employed at all, or if they are, they belong mostly to the class of people who care little about theory, but are proud of their practical knowledge, which does not much differ from the practical knowledge of "the man at the fire."

This condition prevails throughout the whole world. Even the German brassfounder does not care much about employing a metallurgist or having an analytical, metallographic and mechanical laboratory for testing the raw materials and his finished product. It might be said, that even progressive concerns, which feel the importance of scientifical control, are inclined at the present dull time to get rid of as much of this "luxury" as possible.

There are many whose belief in science is so great that they deplore this situation and accuse the manufacturers of being shortsighted, conservative, etc. Nevertheless, such an opinion is far from correct, as is also the instinctive movement among the manufacturers to employ fewer men with only theoretical knowledge and the degree of "Metallurgist." The latter position, howeer, is the one where "there is a reason."

The whole trouble lies in a quite different direction. No manufacturer, no matter how small his business, would refuse to obtain the service of a metallurgist. But he must be sure, that the man whom he puts to work is a real metallurgist. A large proportion of the graduates who want to join a foundry or a rolling mill are not meallurgists at all, and a majority of them cannot even become metallurgists without passing through years of work and mistakes, which very few manufacturers can afford to grant them. This condition is largely a result of improper education, which does not fit the graduate metallurgist for a position which he would be most likely to get after graduation.

For the last fifty years the usefulness of the scientific metallurgist has been recognized by the metallurgical industry in general; particularly in the field of reduction of ores under difficult conditions. Only scientific metallurgists could develop the efficient processes of treating and smelting ores in thousands of tons per day.

This resulted in the development of educational programs which, beside the general and preliminary subjects, included the special courses of ore handling and treatment, metallurgy of iron and the non-ferrous metallurgy. A little time afterward the development of the iron industry led to metallurgical studies, which were included in the program as a special course.

But all this time the work of the brass and metal foundry and of the brass and metal rolling mill was considered too much the domain of the artisan to be scientifically taught in the universities and the old policy of industrial secrecy, which was followed by the then very small business people, only helped to keep the situation unchanged. Even at the present time, very little is being taught in the universities about the non-ferrous alloy industry. The operating and economic sides of the business are neglected entirely, and the small metallographic knowledge which the undergraduate can accumulate from the lectures or text-books is of very little if any use. From the viewpoint of the alloy man, the graduate metallurgist is no metallurgist at all.

Meanwhile, the graduate's chances of entering the foundry or rolling mill, are far greater than his chances of entering the ore-smelting industry. There are hardly more than 100 copper, lead and zinc smelters in the United States, but there are thousands of alloy foundries. The same proportion is true for nearly every other country.

Suppose, for instance, that a graduate metallurgist wants to enter in the services with a small brass foundry, and the owner, being interested in what the applicant really knows about the business, asks him:

"I have to turn out some 1,000 lbs. of small castings for the trade, and I want the metal to contain around 59% copper, 40% zinc and 1% tin. Tell me what kind of material I should charge in the furnace."

Now, if the young metallurgist knows something, he would propose to buy some 600 lbs. of copper, 450 lbs. zinc and 11 lbs. of tin and melt them together. This is what he could get from his former studies and from textbooks. But, of course, the small and practical foundry-owner would answer that such a charge would put him out of business, as the resulting casting would be too expensive for the trade. And he would wonder why the applicant has no idea about the scrap business. Such a lack of knowledge could not be excused in his opinion, by the fact that the applicant can grind and polish a microsection and tell the "alpha" from the "beta" brass. Now, if he examines the applicant further, on the topic of melting, furnaces, crucibles, mouldings, etc., he only becomes more convinced that the man is not worth while and can be of no use.

Few foundrymen are even willing to examine the applicant. To most of them the college man is doomed beforehand, and therefore, foundries are rarely in the hands of the graduate metallurgist.

A few principles covering the question are as follows:

(1) Any foundryman knows that education is very helpful, and he would prefer to have in his service men who are educated, if they can give him real service from the very beginning.

(2) A foundryman can afford to break in a boy who for years can and will accept a few dollars per week, but no small foundryman can afford to break in a man to whom he has to pay from the beginning some $150 per month with the prospect that, when the man gets in, his education will give him a longing for clean hands and a fat salary.

(3). There are more opportunities for the metallurgist to get a position in the alloy business than in the ore smelting field, but he should be better trained for this line by his college course.

As a remedy for the situation the following changes could be made:

(1). The programs of the metallurgical schools should include a special course of metallurgy and technology of non-ferrous alloys.

(2). They should include a laboratory course in an-

alytical, metallurgical and mechanical testing of alloys as applied to castings and rolling mill products.

(3). Students planning to devote their future to the non-ferrous foundry and rolling work, should be provided with ample opportunity for preliminary practical work in these lines, either in some friendly shops not too large in size, or in an experimental plant in the school itself.

(4). As the small foundries are apt to ask for metallurgists who combine knowledge with all around handiness, the future metallurgist should be given facilities to become practically acquainted with hand and machine moulding, sand blasting and other auxiliary trades. It would also be very profitable for him to get some experience in locating and eliminating troubles in the machinery equipment, as used in small jobbing and metal foundries.

(5). Most of all he should be generally acquainted with small industrial bookkeeping and shown how to proceed with an analysis of foundry costs, as the small founder would be inclined to get this service from his metallurgist before anyone else.

It is undeniable that theoretical metallography, even in spite of the short course which it occupies in the colleges, and of its many shortcomings, can be of use for any foundry, but it will be always too difficult to convince a practical founder that it will be profitable in his particular case to employ a metallographer. The same is true about the metallurgical chemist or analyst.

But a man with such knowledge might be very useful from the first day if he is an all-around engineer, and as such he will get the warmest welcome from every founder. In the future he might install any metallurgical control in a scientific direction without great diefficulty in convincing the management which has been taught by experience to be conservative.

Replating Old Britannia Ware

Some Questions and Answers on Replating Worn Articles With Silver

Written for The Metal Industry by CHARLES H. PROCTOR, Plating-Chemical Editor

Q.—(1) Is it necessary or desirable to strip old silverware before replating, or will a light buffing be enough?

(2) If the plating is worn through so that the base metal shows, will the silver take hold or must a copper coat be laid on?

(3) Is it desirable to dip in a mercury cyanide solution after copper plating?

(4) Can a bright silver be laid to require no buffing?

(5) Is this a single plating operation or must the major part of the silver be put on in a regular solution?

(6) What is a good method of cleaning?

A.—(1) It is always advisable to strip the old silver from Britannia ware or articles of iron or steel. This can readily be accomplished by using reversed current and a strong cyanide solution to which is added a small amount of sodium bichromate.

Water	1 gallon
Sodium Cyanide 96.98%	8 ounces
Bichromate of Soda	½ to 1 ounce

The articles to be stripped are made the anodes, and steel can be used as the cathodes. If sheet zinc is used, the silver will be reduced and falls to the bottom of the tank as metallic silver. A voltage of 5 to 6 may be used. Cyanides strip evenly, and their use is the best method for removing the old silver deposit.

(2) and (3) In silver plating, if the base metal is iron or steel, it is advisable to use a copper deposit followed up by a thin coat of mercury obtained from a regular cyanide of mercury dip. However, all steel knives and forks are plated without the use of copper or mercury. In such a case, at least two or, better, three strike solutions are used, the first consisting of sodium cyanide, to which is added small amounts of copper and silver cyanide. With copper and small silver anodes only a faint deposit of metal is discernible.

The second solution contains more silver so that the deposit is discernible. The third contains still more, so that the steel is distinctly silver white. These are the methods used by steel silver-flatware manufacturers.

(4) and (5) Although silver can be deposited with considerable lustre by the aid of bisulphide of carbon and ether (about 1 gram of carbon per gallon of solution), still it is necessary to buff the silver deposit to produce a uniform polished surface. Some firms silver-plate in an ordinary silver solution for a time, and then finish in the bright solution. Usually the double method is used to avoid excessive scratch brushing.

(6) The method in vogue with silver-ware manufacturers is as follows: Cleanse with a caustic potash solution to which is added a little sodium cyanide. Britannia ware is slightly scoured with tampico brushes or cloth buffs, pumice stone and water being used as the abrasive agent. Steel knives are treated in the same way, but it is customary to use two muriatic acid dips for the steel before plating, one 50 per cent solution, the other a 10 to 20 per cent solution. After washing the steel thoroughly, the articles should be immersed in strong, cold caustic potash solutions to neutralize any acid. They should then be washed and placed directly into the cyanide silver strikes. Britannia ware, after pumice-scouring and washing, should be immersed in the caustic potash cleaner, then washed in water, then dipped in a cyanide dip, then re-washed and placed directly in the strongest silver strike.

Nickel Itch

There have been so many requests for information about cures for nickel itch that we have decided to republish the following.—Ed.

Procure some perborate of sodium and peroxide of zinc; both of these materials contain the antiseptic properties of peroxide of hydrogen or dioxogen in their purest form. When using the materials, first wash the hands thoroughly in luke warm water, dry thoroughly and then immerse in a warm solution of perborate of sodium and water in the proportion of

Water	2 quarts
Perborate of sodium	¼ ounce

Immerse the hands in the solution for three to five minutes. Then dry thoroughly and each evening before retiring apply the peroxide of zinc in the form of an ointment. This ointment should be prepared as follows:

Procure some lanolin or white vaseline and add a sufficient amount of peroxide of zinc to form a thick paste or ointment. Rub this ointment into the sores. Continue these applications until the sores are entirely healed.

I would suggest that your men obtain peroxide of zinc soap and use it when washing their hands.

If the blood is kept cool by the aid of a quarter of a teaspoonful of rochelle salts in a tumbler of cold water taken each evening before retiring, it will help a great deal to keep the blood in condition.—CHARLES H. PROCTOR.

Meeting of the Newark Platers

A Report of the Meeting and Annual Banquet of the Newark Branch American Electro-Platers' Society, on April 22, 1922

The Fourth Annual Banquet of the Newark Branch of the American Electro-Platers' Society, was held Saturday, April 22, 1922, at Achtel-Stetter's Hall, 842 Broad street, Newark.

There was an open technical session at 3:30 P. M. with the following program:

Dr. H. S. Lukens of the University of Pennsylvania, covered in his talk, two papers on The Peeling of Nickel Deposits by E. A. Vuilleumier of Dickinson College, Carlisle, Penna., published in THE METAL INDUSTRY for October, 1921, page 419 and March, 1922, page 109. Dr. Lukens explained the work of the contractometer and went into detail showing, as Dr. Vuilleumier had stated, that peeling was due not only to the deposition of hydrogen (if at all) but also to the presence of iron.

In the discussion which followed, G. B. Hogaboom pointed out that other influences were effective in causing peeling, such as the varying depths of the anode and cathode in the solution and the consequent difference in thickness of deposit at different levels. C. H. Proctor, stated his belief that, although other elements might enter into the causes of peeling, hydrogen still remained a very important factor.

E. W. T. Faint gave a talk on the aims and objects of the society and pointed out its importance to platers, chemists, superintendents and manufacturers.

C. H. Proctor, Founder of the Society and plating-Chemical Editor of THE METAL INDUSTRY, read a paper on the Electro-Deposition of Cadmium Versus Zinc and outlined the relative value of the two metals as rust-proof coatings upon articles made of iron and steel. He showed that although cadmium might be a better protection against rust, nevertheless, at the present prices, zinc was much more commercially practical and afforded sufficient protection.

Horace H. Smith of Tiffany & Company, read a paper on the Electro-Deposition of Platinum in which he gave the following solutions, which he stated, were as yet only in the experimental stage:

Dissolve one ounce of platinum to make platinic chloride. Dissolve the platinic chloride in one gallon of water. Add to this sixteen ounces of aqua regia. This solution will deposit platinum on gold plate at the rate of about six grains on three square inches in three minutes. It should be agitated, and the articles to be plated in this solution must be gold plated first. A good heavy deposit can be made but this solution is not good for jewelry.

He suggested as a solution for jewelry (and stated at the same time, that he believed that the solution had a very short life), the following: ten pennyweights of platinum dissolved in aqua regia and evaporated to syrup; the syrup thinned with water and then precipitated with ammonium phosphate. Take up with one ounce of pyrophosphate of soda and add one ounce of sodium phosphate for a conducting agent.

Geo. B. Hogaboom, of the Scovill Manufacturing Company, spoke on the various weights of metal deposited in different parts of a solution, depending upon the depth and general location. He showed that the heaviest deposit generally occurred an inch or two below the surface of the bath. This deposit tapers off toward the center, but then gradually increases again in thickness, being heavier at the bottom of the cathode. This, of course, varies with the comparative depths of anode and cathode.

O. J. Sizelove read a paper on The Use of Chemical Analyses to Control Brass Solutions. He gave a sketch of his methods to control brass solutions and emphasized very strongly the fact that platers should keep a check of their solutions by analysis and not by guess.

Dr. Wm. Blum of the Bureau of Standards, read a paper on The Determination of Hydrogen Ions in Nickel Solutions. He gave a good, quick, practical method of determining the acidity of a nickel solution by colorimetric methods using methyl red as the general indicator.

Royal F. Clark read a paper on Bright Gold Plating.

Philip Uhl, the National President, spoke, congratulating the Newark Branch on its meeting and was followed by Geo. B. Hogaboom, who made a request for aid from the Newark Branch for a movement which was backed by the five New England Branches, namely to hold the next convention in New England. The details of this request can be found in this issue in the columns on Associations and Societies.

There was also an exhibition of work being done by every member of the Newark Branch which proved very interesting, as Newark is noted for its great variety of manufactures. The evening session was of an entirely of a social nature, a good menu, and a good entertainment program being provided. As the ladies were also there, dancing followed the dinner.

Green Finish

Q.—Kindly let me know how to produce the green known as the Barye Green. Mr. Barye is a sculptor and has produced this green finish on some of his work. I have used the following solution and have followed the instructions to the minute, but without results:

Water	1 gal.
Sal ammoniac	8 oz.
Sulphate of copper	8 oz.
Salt	4 oz.
Acetic acid, 28%	2 oz.
Chloride of zinc	1 oz
Glycerine	1 oz.

The articles were allowed to dry from 12 to 24 hours in a damp warm place, but the verde would brush off with the least touch of the brush.

A.—It is advisable to copper and oxidize articles for verde green finish of any description, although some acid greens may be applied directly to a copper or bronze surface.

The formula you have used and submitted to us gives excellent results. Immerse the article first and when partly dry stipple the surface with a painter's sash brush. Do not use any of the acid green solution on the brush unless necessary. Reduce the amount of glycerine if the drying is too slow. In the heat of summer it is advisable to prevent too rapid drying.

To protect the green finish from rubbing off, either spray the surface with a thin coat of lacquer or immerse the articles in a dilute lacquer dip. When thoroughly dry, wax down with a soft brush, using a paste made from beeswax 7 parts, carnauba wax 1 part, turpentine, enough to produce a shoe-polish like paste. Use heat to dissolve the waxes. CHARLES H. PROCTOR.

THE METAL INDUSTRY

With Which Are Incorporated

THE ALUMINUM WORLD, COPPER and BRASS, THE BRASS FOUNDER and FINISHER, THE ELECTRO-PLATERS' REVIEW

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EDITORIAL

TRADE NAMES TRUE AND FALSE

We have received a communication from Evans and Barnhill, Inc., advertising agents of 10 East 43rd Street, New York City, concerning a controversy which has arisen about the trade name Silvore, given to a nickel silver, or nickelene, made by the Seymour Manufacturing Company, of Seymour, Conn., and stated by the manufacturers to contain not less than 10 percent of nickel. The communication is too long to reprint in full, but states in effect that Mr. Taggart, secretary of the Sterling Silver Manufacturers Association attacked them for giving their product a name which so closely resembles silver and which would be very likely to mislead the buyer.

Evans and Barnhill, Inc., reply both for themselves and for the manufacturers that this was never their intention. Their purpose, first of all, in advertising was to educate the public as to what was the actual composition of nickel silver and its various grades. They chose "Silvore" as a trade-name, because, as they stated, "though it looks like silver, it is not silver but an imitation of silver made from 'alloyed ores' and one of such excellence, furthermore, that its manufacturers are proud to advertise it under a name which clearly stamps it imitation." The letter goes on to explain the policy of the Seymour Company, which is to make a dependable base for silver-plated flat and hollow ware. They state that only the finest Lake Superior copper, the best quality spelter, and the highest grade of nickel are used in making "Silvore." They state that although there have been other criticisms besides that of Mr. Taggart, of their choice of a trade name, this name has been registered without opposition in Canada under the Gold and Silver Marking Act, which imposes the severest limitations upon "colorable imitations." The name has also been registered in the United States with the objection of but one official "of decidedly minor authority." It is added, moreover, that the stand of the Seymour Manufacturing Company and Evans and Barnhill has been explained to the Secretary of the Vigilance Committee of the National Jewelers' Protective Association.

With no intent to impugn the motives of the manufacturers or advertising agents in this affair, we must state that our position has always been against the majority of trade names, as an element of confusion in the metal trades. A number of times the METAL INDUSTRY has published editorials and articles on trade names and the nomenclature of metal mixtures*. We have always advocated names which told the truth about the contents of alloys and objected to names which were misleading.

In this respect the greatest sufferer has been the nickel-zinc- mixtures, of which "Silvore" is one. Originally it was known as "German Silver," although, having been first made, we are told, by the Chinese, it is neither German invention nor Silver in fact. During the war it was called "Liberty Silver," a name which had even less reason for existence. At that time we recommended the name nickel brass, since it was simply a copper-zinc mixture plus nickel. In 1920, however, the American Society for Testing Materials recommended as follows:

> The term Nickelene shall be used for nickel-zinc-copper alloys only. In cases where other metals are added this should be designated by the proper prefix or prefixes.
>
> Example: Lead-nickelene.
>
> Composition of alloy:
>
> | | | |
> |---|---|---|
> | Lead | 1 | Per cent |
> | Nickel | 5 | " |
> | Zinc | 31.5 | " |
> | Copper | 61.5 | " |
>
> Systematic name: Lead-nickel-zinc-copper.

Of course if only nickel, copper and zinc are present the name would be simply nickelene. Although this name has not been definitely settled upon or adopted as yet, it should at least serve as a guide for manufacturers.

Now a new name has come into the market—"Silvore." It is a nickel silver, or nickelene, containing, according to the manufacturers not less than 10 percent nickel. As a result we have now on the market (1) Silver, (2) Silvore, (3) Silvel, (4) Nickel Silver and perhaps others. In spite of the similarity of names No. 2, 3, and 4 contain no silver, and No. 3 has neither nickel nor silver. What is the unhappy buyer to do?

Evidence of the growing recognition of this state of affairs is shown by a letter received by us a few months ago from the Associated Advertising Clubs of the World, which stated in part:

> "As a result of an investigation by our Committee and Better Business Bureaus affiliated with us, we have come to the conclusion that "Nickel Silver," as applied to a composition of nickel, copper and other metals, is misleading to the public, and that its use should be discouraged."

Our answer to this letter agreed with their opinion. We have always believed that a trade name should be an indicator of the contents of the material, or at least that it should not mislead; that since an authoritative body like the American Society for Testing Materials has recommended a name for nickel-zinc-copper mixtures, this name should be taken up by the trade, and not changed to suit the desires or whims of the individual manufacturer; that the indiscriminate use of trade names to attract public attention is a nuisance and a hindrance to the progress of the metal business.

*THE METAL INDUSTRY, March, 1917, page 126; February, 1918, page 35; August, 1920, pages 349, 350, 369.

FOUNDRYMEN'S CONVENTION

The 1922 convention of the American Foundrymen's Association will be held in Rochester, June 5-9. This is the first convention since October, 1920, as the gathering of 1921 had to be postponed due to the business conditions at that time.

The 1920 convention held in Columbus, Ohio, was a tremendous affair. The buoyant spirit of business was reflected in the meetings and exhibits, but it is easy to hold a good, live convention in a good year. There is much more reason to make this convention a good one. Business is recovering foundrymen are seeing the light of a steady flow of orders in reasonable quantities. They owe it to themselves to find out what is new in foundry equipment. They will profit from the papers and discussions in the technical sessions. They will meet old friends again, and perhaps the strongest, and certainly most basic reason is that they will improve the foundry industry by supporting its official organization.

Whether business is good or bad every foundryman should be in Rochester during the week of June 5th.

TRADE ASSOCIATION WORK

A good example of work that is being lawfully done by trade organizations abroad is the bulletin issued by the Birmingham Jewelers' and Silversmiths' Association, of Birmingham, England, giving the particulars of the terms and definitions agreed to by the trade for use in connection with the manufacture and sale of rolled gold, gilt and imitation jewelry. In this bulletin a number of terms are standardized: Gold Fronted, Rolled Gold, Gold Plate, Rolled Gold Plate, Gold Filled, Gold Shell, Gold Cased, Gilt, and Fire Gilt or Mercurial Gilt. The definitions of these terms were printed in our April issue; also an editorial on the subject of trade associations.

A similar recommendation was made by the Federal Trade Commission in the United States, with respect to the term "Sheffield" as applied to silver-plated hollow-ware. In a conference between the Federal Trade Commission and the representatives of about fifty per cent. of the manufacturers of silver-plated hollow-ware, the conference adopted almost unanimously the following definition and pledge:

"Resolved, that the word 'Sheffield' as a mark for silver-plated hollow-ware means quality, and that furthermore quality is defined as meaning an article well-plated on a base metal of nickel-silver of not less than ten per cent nickel content; and that the same may have Britannia metal trimmings or mountings.

"The undersigned individually will follow this definition in the marking of silverware and will not either for themselves or at the request of others mark ware which does not conform to this definition with the name 'Sheffield.'"

Without attempting to express a conclusive judgment upon the merits of any particular case, the Federal Trade Commission, in general, disapproves the use of the word "Sheffield" as a trade name or mark for silver-plate hollow-ware and will proceed in individual cases as they come before it upon this basis, with due regard to the merits of any particular case.

NEW BOOKS

Notes on the Corrosion and Production of Condenser Tubes. By G. D. Bengough, M. A., D.Sc., published by the British Institute of Metals. Size 5½ x 8½. 31 pages. Price payable in advance 2s. 6d. For sale by THE METAL INDUSTRY.

These notes were prepared for the Corrosion Research Committee by their investigator Dr. G. D. Bengough. The object which they had in view was the preparation of a document which might be of service to the manufacturers of tubes and condensing plants, and to the engineers who used them. The aim, therefore, is strictly practical. Among the conclusions reached were the following:

1. Under all ordinary circumstances use tubes and ferrules of Admiralty alloy (70:20:1). For exceptions from this rule, see body of pamphlet (pp. 26-29).

2. Give preference to tubes in which the iron is guaranteed to be less than 1 per cent.

3. A clause in specifications calling for an oxidizing annealing for three hours at 350 deg. C. ‡25 deg. C. is worth a trial. Such tubes must not be subsequently pickled. (See p. 24.)

4. When local corrosion has once started in a tube it is practically impossible to stop it, even by electrolytic protection, and tubes are most sensitive to bad conditions when new. Consequently, never allow new tubes to become wholly or partially choked, but clean out as frequently as possible; later in the life of tubes this is not so necessary.

5. Steel protector blocks, if used at all, should be put into condensers at the same time as new tubes.

6. When using protector blocks or any other form of electrolytic protection, always use soft metal rings when packing tubes.

7. Electrolytic protection by motor generator or battery is worth a trial if the tube losses are heavy. It should be applied to new tubes, and maintained continuously, and not intermittently. The details of the installation require careful consideration, and is a matter for experts. Careful watch must be kept for reversal of polarity.

8. Leaky packing is a possible source of corrosion of the tube and ferrule.

9. Auxiliary supplies of steam should be taken into condensers with the main supply at the top, and not separately at the sides.

10. An alteration in water speed may have striking results on the number of tube losses. No general rule can be given in this matter, but trials are worth making when corrosion troubles are serious. If the vacuum in the condenser is low, try raising the speed first, but not above 6 ft. per second; otherwise, try lowering it first. With very high water speeds, such as 10 ft. per second and above, greatly increased trouble is to be expected with arsenical copper tubes, and probably with some other tubes also.

11. Foaming is a serious cause of increased corrosion, so any possible measures should be taken to prevent it, e. g. stop any air leaks in pipe line or at pump. Water containing oil is liable to be specially dangerous.

12. Whenever possible, avoid exposing new tubes to attack by waters liable to be foul, such as the Manchester Ship Canal, the Tyne, the upper reaches of the Clyde.

Burning Liquid Fuel. By William Newton Best. Published by the U. P. C. Book Company, Inc., New York. Sixe 6 x 9. 341 pages. Price payable in advance $5. For sale by THE METAL INDUSTRY.

This is called a practical treatise on the perfect combustion of oils and tars, giving the analyses, calorific values, and heating temperatures of various gravities with information on the design and proper installation of equipment for all classes of service. The work seems to be an expansion of the earlier book by the author on the same topic. It covers a wide range, including what seem to be every industry where oil can be applied.

Of interest to metal users are, in addition to the general chapters on fuel oil and its handling, the chapters on heat treating furnace practice, malleable iron, gray iron and brass foundry practice, modern forge shop practice, copper industry equipment, and enameling equipment.

The book is filled with illustrations, many of them completely detailed, which makes them extremely valuable. The illustrations of burners and burner equipment are, of course, confined to that manufactured by the author, but even taking this into consideration the book is worth having for any one who uses or intends to use fuel oil.

Metal Statistics for 1922, published by the American Metal Market and Daily Iron & Steel Report, New York. Size 4 x 6, 512 pages. Price $1.00, payable in advance. For sale by THE METAL INDUSTRY.

This is the 15th annual edition of Metal Statistics. It is of course well known to all manufacturers and consumers of metal products as a very useful reference book. New tables have been introduced to increase its usefulness. The pages from 239 on are devoted to the non-ferrous metals which will be of particular interest to readers of THE METAL INDUSTRY.

GOVERNMENT PUBLICATIONS

The World's Production of Graphite in 1921.—U. S. Geological Survey, Washington, D. C.

Production of Refined Primary Lead in the United States.—For the years 1919, 1920, 1921. U. S. Geological Survey, Washington, D. C.

Quicksilver in 1920.—By F. L. Ransome, with a bibliography by Isabel P. Evans. U. S. Geological Survey, Washington, D. C.

CORRESPONDENCE and DISCUSSION

Although we cordially invite criticisms and expressions of opinion in these columns, THE METAL INDUSTRY assumes no responsibility for statements made therein.

NO CHANGE IN A. P. MUNNING & COMPANY

To the Editor of THE METAL INDUSTRY:

There is absolutely no truth in the report that I am starting into a new business venture located in Newark, nor is there any intention of my doing so. Ever since the Geo. Zucker Company was amalgamated with A. P. Munning & Company, of Matawan, N. J., on September 1st, 1918, I have been Vice-President of A. P. Munning & Company and have had active charge of the manufacture of their lines of product. This naturally included the brands and processes of the Geo. Zucker Company, which company is still in existence, the capital stock of which is owned by A. P. Munning & Company. The writer has been actively manufacturing compositions only as the Geo. Zucker Company and with the A. P. Munning Company for a continuous period of thirty-six (36) years, and the same high quality and workmanship which has always been used in the manufacture of these compositions by the Geo. Zucker Company is continued to a greater degree, at the plant of A. P. Munning & Company.

There is only one "Acme" brand of White Finish, which has been continually used with such excellent results throughout the entire world and which has been constantly made under my supervision and will continue to be made under my supervision. The same applies to the various grades of high class rouges and compositions made under my supervision by A. P. Munning & Company.

There are so many adulterates and cheap methods used to cheapen the products of composition, that I am glad to be able to make known the facts and to reiterate the policy of the concern that I am now connected with, A. P. Munning & Company, is exactly similar to that of the Geo. Zucker Company, namely: they will not permit anything but the very highest grades of materials to be used—they will never deviate from quality to meet a price, and they will at all times be very glad to prove that the compositions which they furnish at the prices they name, are better and more than equal any other compositions of a comparable nature, and result in a saving to the customer.

I shall be glad to have you publish the above, if you so desire.

Matawan, N. J., April 14, 1922. H. L. ZUCKER.

GREASE FOR GROUND PLUGS

To the Editor of THE METAL INDUSTRY:

I am really very sorry that you paid any serious attention to my grouchy letter regarding the cock-grease. I most certainly never thought that you would give it any consideration and I beg to apologize. Although cock-grease is only a small matter for anyone to talk about. I was at the time sorely perplexed on the subject having to grind keys to the finest order and then literally rain them by putting on a grease made of parafine-wax and mutton tallow. With this grease the keys turn hard when cold water passes through and easy when hot water passes through and very soon the grease dries out. So therefore I looked upon your recommendation with great hopes but they were far from being realized. The receipt was published in last December's issue and is as follows: Beef tallow 25, Lard oil 25, Albany Cup grease 10, beeswax 35. I followed the instruction but the resulting grease is too soft and has no "body." I am forwarding you a sample of the mixture. Later I made a grease of 40% beeswax and mixed in some graphite. This mixture seemed fairly good but I do not know how it will last.

March 19, 1922. A. READER.

To the Editor of THE METAL INDUSTRY:

I am in receipt of sample of Cock Grease as per my request and have examined it. I find out the sample is O. K. to be used on gas and water cocks. For use on hot water cocks the Albany grease should be omitted and beeswax added with flake graphite which will give you the body you require; also for lubricating purposes. This lubricant I have seen used successfully on coffee urns and hot water faucets which are subjected to a high temperature.

The lubricant you were using before had a very poor body because you were using paraffine wax in place of beeswax.

Should you have further trouble with the addition of beeswax and graphite I would suggest you try a small can of cock grease, made by some of the firms advertising in THE METAL INDUSTRY.

Montreal, Canada, March 30, 1922. P. W. BLAIR.

MACHINING ALUMINUM

To the Editor of THE METAL INDUSTRY:

By reading through the April, 1922, issue of THE METAL INDUSTRY, I noted the question and answer regarding the correct speeds, lubricants and also the grinding tools for cutting aluminum and became very much interested in the article due to the fact that I have had considerable experience in the machining of aluminum.

The most economical way to mill aluminum is by the use of a Helical Milling Cutter—the name applying to the form of teeth which are cut on the outside of the disc. I do not know that there are any on the market, but on account of having had considerable experience with this style of cutter, I wish to state that it is the best method of milling aluminum.

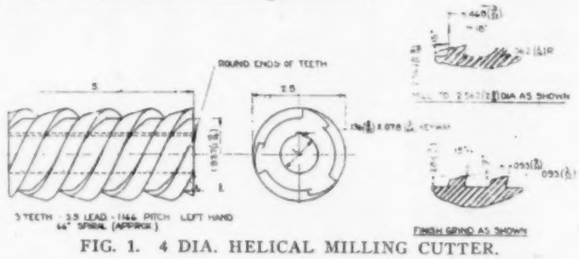


FIG. 1. 4 DIA. HELICAL MILLING CUTTER.

To give some idea of the feed and speed the machines are run at, using this style of cutter, the following will explain same:

We had 3,000 plates to surface—these plates being 1¼" thick, 8" wide and 46" long. One-eighth of an inch of this material

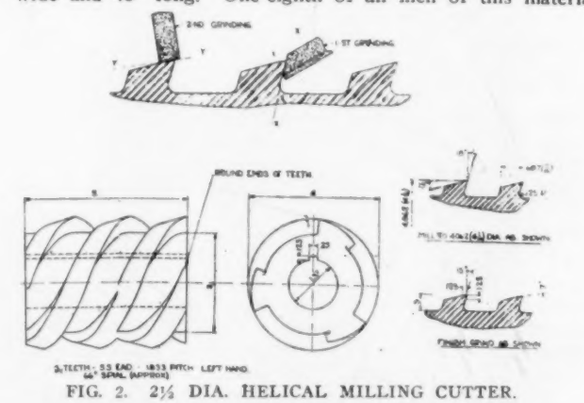


FIG. 2. 2½ DIA. HELICAL MILLING CUTTER.

had to be removed from the eight inch surface the full length of the plate. In attempting to use the ordinary spiral mill, which was ground specially, we could not get production desired and after studying over the matter for some time, I decided to try out one of these special milling cutters. The results obtained from the milling cutting after it was manufactured were satisfactory in every particular. The machine was set at a feed of 15 feet per minute and the cutter was run at 275 revolutions per minute.

I have not time at the present to enter in on this subject in detail, but am enclosing a photostat of the cutter. This information, undoubtedly, will be of benefit to the person asking the question pertaining to milling aluminum and if the photostat of the cutter is not self explanatory, he may write me and I will enter into detail in the manufacture of such a cutter.

Moline, Illinois, E. O. GRASSLEY,
April 20, 1922. Superintendent of Planning

SHOP PROBLEMS

IN THIS DEPARTMENT WE ANSWER QUESTIONS RELATING TO SHOP PRACTICE

ASSOCIATE EDITORS { JESSE L. JONES, Metallurgical; WILLIAM J. REARDON, Foundry; PETER W. BLAIR, Mechanical; LOUIS J. KROM, Rolling Mill; CHARLES H. PROCTOR, Plating-Chemical; R. E. SEARCH, Exchange-Research.

ACID-RESISTING BEARING METAL

Q.—What is a good mixture for an acid-resisting bearing metal?

A.—For a mixture of metal for an acid resisting metal for bearings, we would suggest a mixture of the following:

83 lbs. Copper.
14 " Lead.
6 " Tin.
1 " 15% Phosphor Copper.

—W. J. R. Problem 3,074.

CLOSET SPUDS

Q.—You may think that I am asking a jugful, but at any rate I would highly appreciate any information as to the following. How can I mix, make and thread (that is, what machinery would I need to thread) closet spuds.

Also bear in mind this is a quantity proposition, and must be made of a very cheap material as the wholesale price is 13 cents each with nut, washer and spud completely threaded.

A.—At the price you quote for these closet spuds, your equipment must be up-to-date to get production in all operations from patterns to finished article, and must be made up in large quantities of no less than 1,000 in a lot. Patterns must be mounted on plates, using gang core box for cores for spud.

Use clean scrap yellow brass, and add 4 lbs. zinc, 1 lb. lead to each 100 lbs. scrap. A small piece of aluminum dropped into the pot before pouring will make the metal flow freely and keep down the fumes. As these spuds do not have to stand any pressure, the addition of the aluminum will keep the castings clean on the surface.

The method to pursue in machining is to chuck the spud for threading on the bell end, holding by air chuck if you have air. If your equipment does not consist of air-chucking in turret lathe, use spring collet, box-tool, and self-opening die for cutting thread. The lock-nut can be cast with correct inside diameter with chamfer on face, so that tap will cut a full thread in depth. It is unnecessary to drill and face these nuts, as a brass friction ring and rubber gasket is used in connection. To hold when tapping use air or spring collet, or revolve tap and check nut in solid holder, fitting hexes on all six sides and resting on rim.—P. W. B. Problem 3,075.

CRACKED ZINC CASTINGS

Q.—I am establishing an electric table lamp manufacturing business and am using spelter castings for shade panels and other parts of the lamps. These are being cast in bronze molds and we are having considerable difficulty in getting perfect casting without cracks. The castings are coming all right with the exception of at least one crack in each casting. Can you inform me as to what causes these cracks and the remedy for it?

A.—The crack in the spelter castings in bronze molds is generally caused by lead in the zinc, or oxide of zinc in the spelter. Aluminum is sometimes used to overcome this difficulty, but should be used in very small quantities, not over 4 ounces to 100 pounds, or it will cause trouble in the plating. When casting spelter castings, the grade of metal used plays an important part. It is advisable when trouble of this kind appears in zinc castings cast in bronze molds, to use the highest grade zinc, which usually assay, .9995 pure.

You will find fewer cracked castings than any other grade of zinc will produce. If your molds are designed properly, we believe by using this grade of zinc that you will be able to eliminate your trouble.—W. J. R. Problem 3,076.

CRUMBLING ALUMINUM CASTINGS

Q.—Can you kindly advise us on the following question?

About six months ago we made some aluminum castings for flower plant irrigators. The tops of these castings are about an ⅛" thick with slots about ¼" wide, whereby water is drawn through. Now these slots in time rot away, in other words, crumble to pieces. Can you tell us if aluminum can be used where water is continually passing through, and if so what would be the best analysis.

A.—For your class of work we would recommend a mixture of the following:

98% Aluminum.
2% Manganese.

This alloy is as near pure aluminum as can be cast. It is, therefore, of a low Brinell hardness, and is particularly useful to withstand chemical action of food acids. If this mixture is too soft, we would suggest a mixture of:

90% Aluminum.
10% Pure Silicon.

An alloy of 50% silicon and 50% aluminum is best used to make this mixture.—W. J. R. Problem 3,077.

HOT TINNING COPPER

Q.—We should be very much obliged to you if you could give us any information as to the process of tin coating copper sheets on both sides by the hot-dip process. You will see by this that we are not referring to the planishing process.

A.—Copper sheets are usually tinned in the following manner: An iron pot having a capacity of about 750 pounds is inclosed in a brick furnace and heated by any suitable means. The fumes are taken care of by means of a hood hung over the pot with an opening into the chimney. The top of the tin is covered with a suitable flux such as chloride of zinc, tallow, rosin or some patented mixture or sal ammoniac may be used. Straits or Banca tin should be used. An inclined bench is placed at one side of the furnace and the end of it reaches to the melting pot. The sheets of copper which have been previously cleaned and dried are wiped over with a solution of chloride of zinc before the molten tin is applied to them. The sheet of copper is placed upon the bench and the tin is poured over it, beginning at the top, in such a manner that the whole sheet is covered. The sheet is then wiped off with a bundle of tow. Some tinners add a little lead to the tinning, bath, claiming that it makes the coating smoother and more adhesive. Care must be taken to protect the molten tin from the air as much as possible as it quickly oxidizes and forms dross, which is skimmed off from time to time as necessary by means of a perforated ladle. This dross is afterwards sweated in a furnace and some of the tin recovered. Poling the bath with a stick of green hickory wood helps to keep it clear. Sheets may be automatically tinned on one or two sides by means of a special machine made for this purpose. The manner of operating these machines is as important as the machine itself, and this subject should be taken up with the manufacturers of the machine. Perhaps the manufacturers of machinery for galvanizing iron sheets might have some very good ideas upon this subject.—P. M. T. Problem 3,078.

OIL-TIGHT ALUMINUM MIXTURE

Q.—I have been trying to make some valves from aluminium that will hold kerosene oil under pressure but find they all leak.

Could you inform me of an aluminum alloy that would do the work?

A.—We would suggest the following: For pressure work an aluminum allow consisting of 12% copper and 88% aluminum finds considerable favor among people making castings for pressure work, and is made as follows:

A hardener is made of 59% copper, 50% aluminum and pour into ingots. Seventy-six per cent of aluminum is melted and 24% of the hardener added and fluxed with a small piece of chloride of zinc. Pour at approximately 1,350 degrees Fahr. Another good mixture consists of:

96%	Aluminum
2%	Magnesium
2%	Copper

This mixture is given by the Shawinigan Electro Metals Company, Ltd., Montreal, Canada. It is said to withstand hydraulic pressure without showing any leakage in 3" standard valve tested to 450 lbs. per sq. in. hydraulic pressure with only 3/16" wall thickness.—W. J. R. Problem 3,079.

PICKLING TANK

Q.—I have had a great deal of trouble with lead-lined tanks for pickling cast iron. The pickle is made up of sulphuric acid and water. What effect would the pickle have on a cement tank?

A.—Cement tanks cannot be used for acid pickling solutions unless they are coated with an asphaltum mixture that will prevent local action of the acid upon the cement.

The Barrett Company of New York prepares a mixture of asphaltum and gum mastic that resists acids at fairly high temperatures. Lead lined tanks are still used universally, but they must be properly prepared; a good quantity of sheet lead used, which is not less than ⅛ inch in thickness.

The seams should be burned in and not seamed and soft soldered, as is frequently done.

A lead lined tank with the seams properly welded together by lead burning should last for years. There is nothing better for the purpose, except vitrified earthenware tanks, but these are expensive and breakable. A lead lined tank is permanent.

If you use a lead lining in a concrete tank the results will be satisfactory, but it would be advisable to extend the lead down the front of the tank to prevent the pickle from coming in contact with the cement during pickling operations. C. H. P. Problem 3,080.

PLATING SILVERWARE

Q.—(1) I am silver plating sandwich plates. On the spun edges they leak and the deposit either peels or is very matted. Those edges which dot not leak plate very well.

(2) I am plating nickel silver cups with handles made of lead 82, tin 12, antimony 6. These handles come out spotted.

A.—If you could influence your firm to soft solder the spun edge, that causes your trouble of peeling, then trouble would cease. If you are unable to do this after cleansing, etc., immerse in a weak hot cyanide dip for a moment or two. Then, if you have air pressure for soldering or lacquering, deflect a strong current of air entirely around the edge thereby blowing out all cleansing of other material, that may be occluded in the spun edge.

We have reason to believe that perhaps a little tallow or soap may be used as a lubricant in turning the edge. Either of these materials would cause your trouble, if not removed in the cleansing and washing operations.

No. 2. Why do you not copper-plate the handles made up from the lead tin antimony alloy, before they are soldered on the cups? This method would assure an adhesive deposit; or flash them in nickel and then in silver.

Your cleaners become occluded in the porous spots of the handles and cause the trouble you state. If you plate the handles first you eliminate your trouble.—C. H. P. Problem 3,081.

SPOTTED COPPER SHEETS

Q.—As subscribers to the METAL INDUSTRY, we shall very much appreciate your opinion on the marks on the surface of the samples which we are enclosing. We have been supplying this metal for some considerable time without any complaint, but recently the marks, as shown on the surface of samples, have appeared, without any apparent explanation.

The articles which are made from this metal, when finished, are dipped, and the marks then are very much more pronounced.

A.—Upon examination of the two samples of brass submitted there appear two distinct faults either of which may be remeded.

First, there are the light colored spots or freckles which are distributed promiscuously throughout the surfaces of the samples. These spots probably originate in the casting shop. They may be caused by not having the metal hot enough before adding the zinc, and then not bringing it to the proper heat before pouring. They may be caused by allowing the metal to stay in the furnace too long after the addition of the zinc or the metal may have been too hot when the zinc was added and then not cooled to the proper pouring heat. Also, perhaps the metal was not properly protected during the melting operation. Only clean metals should be used and copper containing copper scale should be avoided. Watch the melting operation carefully and check up on each operation; if the gates are cut off before rolling examine the cut ends carefully for white specks. Watch all annealing operations and do not allow the metal to scale or blister in the annealing furnace. When rolling do not try to reduce more than 40% between annealings.

Second, the streaks which run uniformly in the direction of rolling may originate at the breaking down rolls or at the running down rolls due to the surface of the rolls being coated, or, dirt may in some way get upon the surface of the metal and be rolled into it, or, perhaps the pickeling operation may not be thorough enough. Perhaps the pickeling operation is not performed often enough; try pickeling first at about ¼" thick.

Probably the safest thing to do would be to begin at the casting shop and check each operation carefully from there to the finishing rolls. Note at which operation the spots first make their appearance and then check back from that point. Keep clean always.—P. M. T. Problem 3,082.

STOP-OFF FOR GOLD

Q.—What is a good stop-off for hot gold solution?

A.—A good stop-off is prepared by dissolving Gum Guaiacum in acetone to a heavy varnish consistency. Color with a little aniline blue or violet so that you can readily see the varnish as you apply it to the metal surface. Be sure to strain your own mixtures through several thicknesses of cheese cloth to remove any sediment.—C. H. P. Problem 3,083.

ZINC SOLUTIONS

Q.—What is a good formula for zinc plating?

A.—If the parts you desire to zinc plate are made of steel, then the following solution will give you excellent results:

Water	1	gallon
Sodium Cyanide	4	ounces
Zinc Cyanide	4	"
Caustic Soda	1	"
Soda Ash	2	"
Corn Syrup	1	"
Sodium Fluoride	1	"

Prepare the solution in the order given, using about half the amount of water first at a temperature of 160 degrees Fahr.

Use the solution at 120 degrees Fahr., at 6 volts with heavy sheet or cast zinc anodes.

If your articles are of cast iron and steel then use the following solution:

Water	1	gallon
Zinc Sulphate	1½	lbs.
Sodium Sulphate	4	ounces
Aluminum Sulphate	4	"
Boracic Acid	2	"
Sal Ammoniac	2	"
Corn Syrup	½	"

Temperature 80° F., 4 volts.—C. H. P. Problem 3,084.

PATENTS

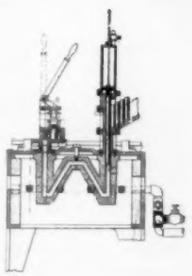
A REVIEW OF CURRENT PATENTS OF INTEREST

1,402,997. January 10, 1922. **Method of Welding.** James L. Anderson, of Bayonne, N. J., assignor to Davis-Bournonville Company, of New York, N. Y.

The purpose of the present process is to obtain stronger welds with less difficulty and danger of defect and with equal or greater speed and with economy of gases. This is accomplished by spreading or distributing the heating at opposite sides of the center line or plane of the seam, as by two adjacent rows of jets, which play back of the edges, directing the main portion of the flame to the metal at opposite sides of the crevice. Thereby the intense heat of the inner cones of the jets is applied more effectively to the parts to be united, loss of working heat by escape of gas through the seam and injury to the weld are avoided, and the welding is effected largely by radiant heat between the jets. The intense heat is spread laterally even more widely than in the simple case of a single round jet.

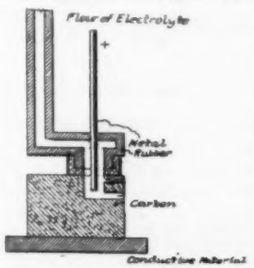
1,403,955. January 17, 1922. **Apparatus for Die-Casting Metals.** Harriet Hill, of New York, N. Y.

A casting apparatus comprising a melting-pot having two vertical chambers, two inclined chambers and a connecting chamber, means for heating the melting-pot, means for feeding billets automatically and progressively into one of the vertical chambers of the melting-pot, and a casting head situated over the opposite vertical chamber of the melting-pot.



1,403,903. January 17, 1922. **Electroplating Carbon Articles.** Victor C. Hamister, of Cleveland, Ohio, assignor to National Carbon Company, Inc.

The object of the invention is to provide a method whereby the walls of a hole or recess may be covered with a uniform, coherent coating of metal without the production of any substantial amount of deposit on the exterior of the brush or the like, adjacent to the hole or recess, where its presence would be unnecessary or undesirable. A further object is to make possible the use of high current densities in such a method in order that the plating may be rapidly completed.



1,404,615. January 24, 1922. **Apparatus for and Method of Heating Metal.** William Wallace Kemp and William H. Van Horn, of Baltimore, Md.

This invention has its main objects to provide a method of heating fusible metals, which is very efficient in operation in that it is economical, substantially all of the heat being employed to heat and maintain the fusible metal in a heated condition, and practically none of the heat being dissipated into the atmosphere before it is employed to heat the fusible metal; wherein danger of cracking or other injury to the pot or container during the melting operation is eliminated; the temperature of the fused metal may be regulated to a nicety, and wherein the products of combustion are employed to prevent oxidation of the fused metal.

1,403,558. January 17, 1922. **Metallic Alloy.** Ambrose J. Mandell, of Morristown, N. J., assignor to Electrical Alloy Company, of Morristown, N. J.

This invention relates to an improved metal alloy, and has for its primary object to provide a composition consisting of several metallic ingredients proportioned in such a manner as to produce a metal alloy which is characterized by high electrical resistance properties; great resistance to corrosion and oxidation and possessing high tensile strength.

The constituents of my improved alloy are as follows and may vary by weight between the limits stated:

Nickel	40-65%
Copper	20-30%
Iron	02-15%
Manganese	02-25%

1,404,156. January 17, 1922. **Plating Electrolyte and Process of Making Same.** Quintin Marino, of London, England.

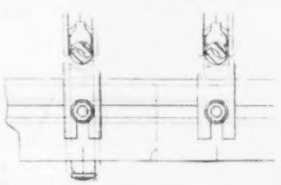
It is well known that heretofore it has been found impossible to deposit nickel or cobalt from a cyanide solution upon a metallic surface, and the object of this invention is to enable these metals as well as alloys of these metals with silver or tin so to be deposited.

1,405,167. January 31, 1922. **Lead-Coating Process.** Robert Jay Shoemaker, of Chicago, Ill., assignor to Leading Company, of Chicago, Ill., a corporation of Illinois.

This invention relates to the operation of coating or plating articles made of iron or steel, with a lead plating; and the primary object of the invention is to provide an improved plating process which will be simpler and more economical than the methods heretofore used, and whereby the body or article may be plated or coated with a film of the plating metal which will be very thin, so that the plating metal is not wasted, but at the same time even, homogeneous and non-porous in character.

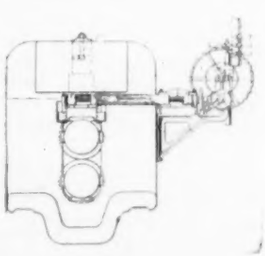
1,405,985. February 7, 1922. **Rolling-Mill Guide.** Lars M. Ekstrand, of Waukegan, Ill., assignor to the American Steel and Wire Company of New Jersey, a corporation of New Jersey.

This invention relates to rolling mill guides, and more particularly to guides used in rolling mills to guide bars or rods into the rolls, and has for one of its objects the provision of a twisted guide of this class that may be rotated in the guide box as the guide passage wears. Another object of the invention is to provide means for allowing the escape of scale, water, and the like matter from the guide passage.



1,405,438. February 7, 1922. **Rolling-Mill Bearing.** John H. Quinn, of Cincinnati, Ohio.

One of the objects of the invention is to provide a bearing abutment for one of the rolls of a rolling mill, which is very substantial in construction to withstand for a long period heavy thrust-blows or pressure imparted thereto by the rolls in starting and rolling the work between the rolls.



EQUIPMENT

NEW AND USEFUL DEVICES, MACHINERY AND SUPPLIES OF INTEREST

INDUSTRIAL BRUSHES

The house of William Dixon, Incorporated, is what might be called one of the pioneers in the industrial brush business of the United States.

The late William Dixon, the founder of the company, started as an apprentice in the brush business at the age of sixteen years and worked at this trade until in the year 1860 he started in business for himself in a small way, making brushes of all descriptions, but gradually eliminated all other branches and specialized in making brushes for industrial purposes.

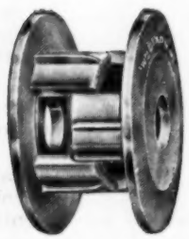
Among brushes other than those used for polishing, were brushes to put special finishes on leather and metals of all descriptions; also brushes used on tobacco machines and on other automatic machinery used for cleansing iron pipe preparing the surface for galvanizing or other treatments.

Scratch brushes made of the various kinds of wire such as brass, steel and German silver are used for putting various finishes on metal. The various sizes of the wire in thousandths of an inch affect the different kinds of finishes and the construction of the brush, such for instance as an open brush with a distance between the knots or rows will give the article a satin finish effect, whereas a full or condensed surface imparts a scratch brush or even finish. The heavier wire brushes are used for cleaning and finishing castings of all kinds preparatory for nickel or brass plating, etc.

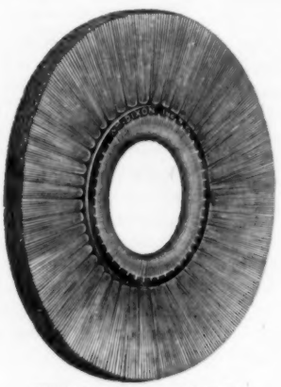
Bristle brushes in their many different grades and mixtures are used for scouring, cleaning and polishing purposes. They are made in a very large variety of special shapes and sizes to get into the most intricate crevices, and the line manufactured by William Dixon, Inc., are consumed mostly by manufacturing jewelers, silversmiths, platers and polishers. They specialize on brushes for practically any requirement in this connection and, according to their records, have made more than 9,000 special scratch brushes and 5,000 special bristle brushes in addition to their standard line.

The company has also specialized in making small brushes which are used by the dentists for polishing teeth. Mr. Dixon invented and patented the circular brush used by dentists a good many years ago and the dental department is a large and important one in the manufacturing plant.

In 1917, the company purchased a four-story building at 34-36 East Kinney street, Newark, at which time they thought they would have plenty of space for their requirements for many years to come, but they soon needed additional room and the first part of the year 1920 they built an addition to their building.



ALUMINUM HUB



INDIVIDUAL SECTION

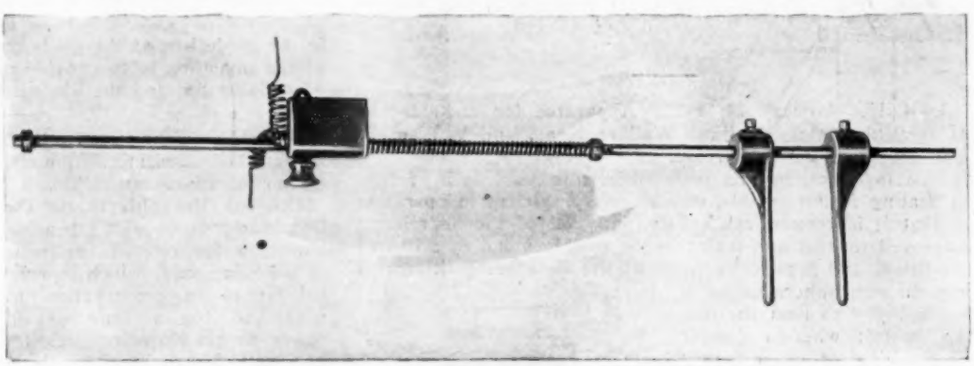
COMPLETE BRUSH

NEW SAFETY STOP

The Simplex Safety Stop is designed to stop automatic machines for any of the following causes: Any irregularity; oversize; undersize; breakage; end of work; changed tension; changed temperature; changed speed, etc. A latch in the stop holds the notched belt shifter rod (or clutch operating rod) in the running position. Wires run from the stop to contact points placed wherever trouble may occur in the machine. The contact points close in case of trouble, releasing the latch, the spring on the rod immediately throwing the belt to the loose pulley (or the clutch out of operation).

The stop hangs from the belt shifter or clutch rod. No fastening is required.

The Simplex Safety Stop is so constructed that the pressure of the shifter rod against the latch is reduced by two unequal arm levers. The second lever bears very lightly against an extension of the armature. When the magnets are energized

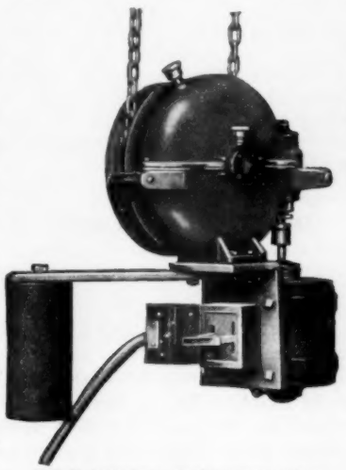


SIMPLEX SAFETY STOP.

the armature is drawn to a vertical position, releasing the levers and latch. The latch, in unlocking, operates a circuit breaker, thus, it is claimed, economizing current and avoiding any possibility of injury to the insulation. A hand stop is also provided. It is manufactured by the Atlantic Company, 452 Classon avenue, Brooklyn, N. Y.

NEW HOIST

Users of hand power hoists of five tons and larger capacity will be interested in a patented electric machine that can be suspended in the bight of the operating chain, and is said to have a capacity to overhaul 138 feet of hand chain per minute and chain pull of 130 pounds. This gives a load lifting speed of approximately four times that obtainable by hand power and requires but one man for operation.



NEW JERSEY FOUNDRY AND MACHINE COMPANY HOIST.

Current can be supplied by a flexible conductor from convenient sockets or suspended from the hoist if more desirable to bring feeders to that point. The machine, it is stated, balances itself, weighs about 160 pounds and is easily handled. The gears are hardened and run in oil. It can be furnished for operation on both alternating and direct current.

The machine is manufactured by the New Jersey Foundry & Machine Company, 90 West street, New York City.

NEW WASHING MACHINE

This machine, which is manufactured by the Colt's Patent Fire Arms Manufacturing Company, of Hartford, Conn., is especially designed for the needs of manufacturing establishments where there is need for washing and cleaning parts or material in process. Its operation is continuous and automatic; no hand pushing is required.

The conveyor can be speeded to travel at either 10 feet or 17 feet per minute, depending upon the requirements. The manufacturers recommend a speed of 10 feet per minute and will so furnish the machine unless otherwise specified. This rate of speed permits of the parts remaining in the solution for a longer time and also enables one man to handle the work.

The number of trays that can be put through the machine per hour depends upon the size of trays. Work not exceeding 20" in width and 14" in height can be cleaned by this machine.

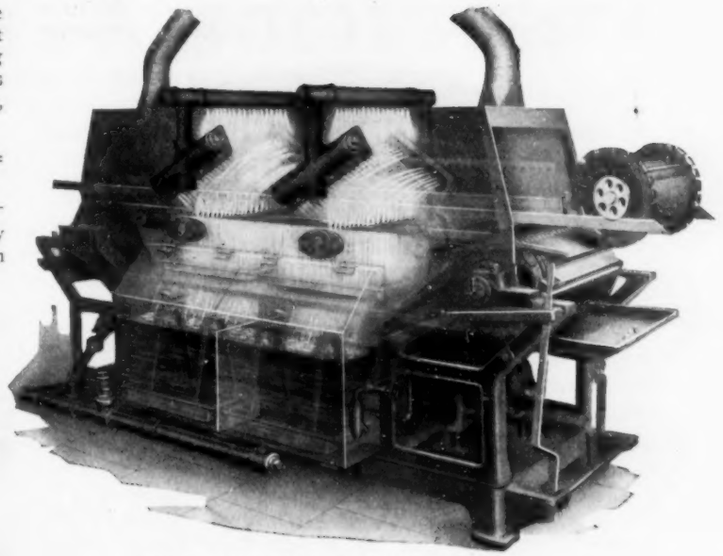
The conveyor is supported throughout its entire length, thus eliminating sag under heavy loads. The conveyor support is made of a series of idle rolls so as to reduce friction.

When work is placed on the conveyor it passes through two sets of sprays operating on both sides, top and bottom, thus insuring a positive wash regardless of the shape of the article being processed.

The conveyor is controlled by a lever which enables it to be started or stopped at will by the operator. This has no effect on the sprays which act independently and continue to function as long as the motor is in operation.

Should any article fall partially through the conveyor an automatic trip mechanism is provided which will stop the conveyor until the obstruction is removed. This feature is very desirable and prevents possible injury to the working parts. Should an article fall through the conveyor it will be caught in the chip trays below and not go into the tank.

A special feature, exclusive with this machine, it is claimed, is the rotating tumbling barrel for use in establishments where large quantities of small parts that cannot be racked,



COLT "AUTOSAN" WASHING MACHINE.

such as screws, bolts, nuts, washers, small stampings, etc., are washed or cleaned. This barrel has a positive traveling speed, and, it is stated, tumbles the parts very slowly, permitting every article to be thoroughly washed. As the barrel leaves the machine, it is caught in a certain position that will readily permit of placing a box or tray under the barrel and emptying it without having to lift or hold it in any way.

NEW METAL FINISHING WHEEL

The Cheney Metal Finishing Wheel was, it is stated, invented, developed and perfected because of the inability to purchase wheels that would give of the Henry Cheney Hammer Corporation, of Little Falls, N. Y., the quality demanded and production necessary to meet competition.

CHENEY WHEEL—FACE VIEW.

The wheels are constructed by glueing a number of strips of wood together cross-grained which prevents warpage and gives strength. The rim is recessed to receive the double dovetailed segments which form the cushion as shown on sectional cut. Each segment is placed separately in the rim, seated in glue and pinned with specially made countersunk brad.

The cushion is composed of segments, each segment tapered before being inserted to insure perfect fit, and not in any way forced by compression. The density of the cushion is produced entirely by the material therein, thus is guaranteed

to remain the same density throughout its entire thickness and can, it is claimed, be used until worn to the wood center.

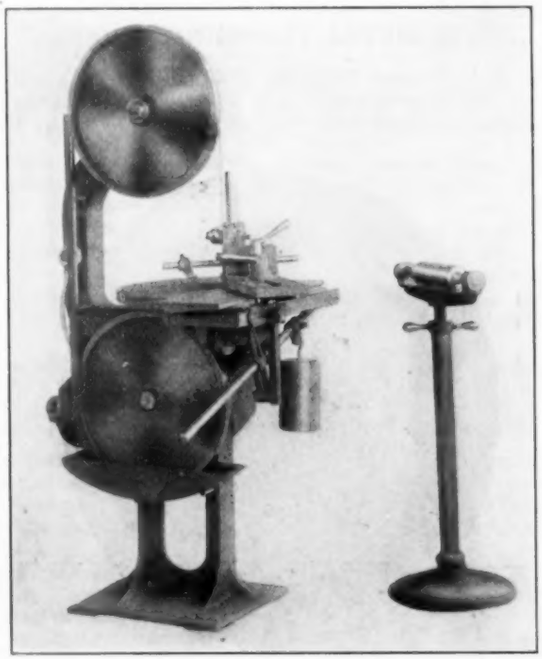
CHENEY WHEEL—SECTION.

When the cushion is worn completely through, a new cushion of any density or material can be inserted at a small percentage of the original cost of the wheel.

NEW METAL CUTTING BAND SAW

The Clark Junior metal cutting band saw is a machine of the same general design as the Clark Special Brass Cutting Saw, put on the market a year ago, except that it is provided with a special swivel table for cutting long pieces. It also has in addition a movable carriage with gravity feed and a vise for holding work.

This vise swivels from the center for cutting angles. By loosening one cap screw, it is possible in a few seconds to set vise to the graduations to cut any angle. By removing this same cap screw, the vise can be lifted off entirely, leaving a smooth table 24" x 20" for use when sawing plates or cutting irregular shapes by hand feed.



CLARK, JUNIOR, METAL CUTTING BAND SAW

To cut large plates the upper guide and guide support rod can be removed by loosening one set screw. As the machine is provided with a lower guide in a recess in the table, the one guide holds saw straight enough for all ordinary cutting purposes.

The machine is ball bearing throughout and bearings are so designed that they will require practically no attention. The lower bearings take their lubrication from the gear box. The upper wheel bearing is packed in grease and will run for months without refilling. It is made by the Clark Tool Works, Inc., Belmont, N. Y.

NEW GRADES OF TIN OXIDE

The Metal & Thermit Corporation, New York, N. Y., is manufacturing and has recently placed on the market two high grades of tin oxide which, it is stated, are already being used in large quantities in the manufacture of enamels for sheet steel and cast iron and in the making of glazes for sanitary pottery and terra cotta.

The starting point of this process of making tin oxide is a supply of chemically pure crystals of sodium stannate absolutely free from iron, arsenic lead and other impurities which are unavoidably present in small amounts in so-called pure pig tin. By a series of very carefully controlled chemical operations, which culminate in the treatment of the product in an electric furnace at a very high temperature for a period of 8 hours, the soda content of the material is reduced below one-tenth of one per cent and a tin oxide finally obtained which both chemically and physically is claimed to be admirably suited for use in enamels, glazes and other ceramic products.

ROCHESTER CONVENTION EXHIBITS

MONARCH ENGINEERING AND MANUFACTURING COMPANY
BALTIMORE, MD.

The representatives will be Frank Maujean, James V. Martin, Lees Hall, William Raber, I. D. Adams, and H. D. Harvey. They will be located at the Hotel Seneca, and will be in Building No. 5, Spaces No. 78, 80 and 82.

One No. 125 special tilting, combustion chamber, crucible furnace, open flame, Hall type incandescent oil burner.

One foundry cupola, coke, combination stationary and tilting, capacity one ton, motor blower.

One foundry cupola, coke, tilting, capacity 300 lbs.

One Blizzard universal sand mixer.

One pre-heated air No. 80 stationary crucible furnace, combination oil and gas.

One stationary crucible furnace No. 80, combination oil and gas.

One tilting crucible furnace No. 125, oil or gas, with motor blower.

One double chamber furnace without crucibles, No. 1, oil or gas.

One Simplex single chamber furnace, without crucibles No. 92, oil or gas.

One motor driven continuous revolving furnace, 500 lbs. capacity, without crucibles.

One combination core oven, oil or gas.

One core oven, coke.

One stationary soft metal furnace, combination oil and gas.

One tilting iron pot furnace for aluminum.

One monometers soft metal furnace, automatic control. Special.

One oil pump.

One positive pressure blower.

One motor blower.

One double pre-heated air shell tilting crucible coke furnace, No. 80.

One hardening and annealing furnace.

One combination 8 in 1 annealing furnace.

One ladle heater combination.

One portable heater.

WHITE & BROTHER, INC., PHILADELPHIA, PA.

They will occupy space No. 273 at the Foundrymen's Convention, Rochester, New York, week of June 5, exhibiting Certificate Metals in their entirety, comprising composition and yellow ingot brass, marine brand manganese bronze, C. C. brand of casting copper and white metals.

Those in attendance will be G. Horace Krider, L. D. Kluver, Raymond Hunter, Harold Reinhardt, C. B. White and Frank Krug.

ASSOCIATIONS and SOCIETIES

REPORTS OF THE CURRENT PROCEEDINGS OF THE VARIOUS ORGANIZATIONS

INSTITUTE OF METALS DIVISION

HEADQUARTERS, 29 W. 39th STREET, NEW YORK

A conference of the Advisory Committee on Non-Ferrous Alloys of the Institute of Metals Division of the American Mining and Metallurgical Engineers with representatives of the United States Bureau of Mines was held at the Bureau of Mines, Washington, D. C., April 25. This was the second meeting held for the purpose of developing a program of cooperation between the non-ferrous metal industries, as represented by the Institute of Metals Advisory Committee, and the Bureau of Mines, with especial reference to the non-ferrous work of the latter organization.

The conference discussed the question of the functions and possibility of development of the proposed Alloys Research Association, now known as the Alloys Research Information Service. As originally proposed, it was the idea to receive contributions of $250 each from firms in the non-ferrous metal industry for promoting a central information service. A fund of $40,000 was required for this work, which would begin as an information and abstracting service and later develop into a central research laboratory. The feeling was that, owing to the depressed industrial situation, it would not be a propitious time to push the matter.

The question of refractories for the Ajax-Wyatt furnace was brought up by William B. Price, of the Scovill Manufacturing Company. It was stated that a number of companies were working on the problem, and it was suggested that their interests and information be pooled. The facilities of the ceramic section of the Bureau of Mines were offered as a clearing house for information in regard to refractories for the furnace.

The desirability of investigating copper-lead alloys was discussed.

R. J. Anderson, metallurgist of the Bureau of Mines, outlined the results of recent work at the Pittsburgh experiment station in regard to (1) the contraction of aluminum alloys, (2) removal of stress in brass tubing and (3) heat treatment of cast non-ferrous alloys. He stated that linear contraction experiments had been run in chill molds and sand molds on 40 aluminum alloys, and the results showed that in the series of alloys the contraction varied between the limits 0.95 and 1.70 per cent. In the general discussion of the contraction and shrinkage problem, it was felt that the whole situation needed clarifying, and that the results of the work should be made available. It was stated that shrinkage is dependent upon structural changes occurring on solidification and that there is not necessarily any relation among shrinkage, hot shortness, and tensile strength. It was stated also that the effect of degasifying and dexodizing alloys might have some considerable effect on shrinkage and hot shortness. The investigation of the effect of chills, risers, and molding practice upon shrinkage was suggested.

W. M. Corse* of the Monel Metal Products Corporation brought up the question of centrifugal casting and suggested that the investigation of the process might properly fall within the scope of the Bureau of Mines. This method of casting is now of considerable interest, and has been worked out commercially although there are considerable difficulties still involved. It has been shown to be the best method for casting copper-lead alloys and has been used for large naval castings. It was felt by the Bureau of Mines that a suitable investigative program would call for considerable outlay of funds and that the matter should be given careful consideration.

The possibility of the preparation of copper-iron alloys to replace brass was suggested, but it was felt that there were no possibilities in this direction.

The question of so-called super-refractories was discussed, and the statement made that certain of these, such as synthetic spinels, had been worked out successfully on the Pacific Coast.

Lieut. Commander Bowson stated that the Bureau of Ordnance was having difficulty in obtaining a suitable container for the illuminant in illuminating projectiles, and that a container which would burn down at about the same rate as the illuminant was desirable.

The possibilities of lithium and its alloys was discussed.

*Now with the National Research Council, Washington, D. C.

AMERICAN ELECTROPLATERS' SOCIETY

HEADQUARTERS, c/o J. E. STERLING, 468 GRAND AVE., LONG ISLAND CITY, N. Y.

CINCINNATI CONVENTION

When the American Electroplaters' Society foregather in Cincinnati, Ohio, June 28, for its annual four-days' convention, the delegates will find that the 39 "live" members of the local chapter have completed arrangements for a most interesting and profitable meeting.

The morning of the opening day will be given over to registration at the new Hotel Gibson, the addition to which is now being erected, and which, when completed, will be one of the largest and most beautiful hotels in the Middle West. An executive session will be held in the afternoon, and in the evening the delegates will have opportunity to renew acquaintances.

The first general session will be held at the hotel Thursday morning, regular morning and afternoon sessions being scheduled for both Thursday and Friday, with capable speakers on the program. The annual dinner will be held at the hotel Thursday evening, attended by the delegates and their wives.

Friday evening a party will be held for the visitors at one of Cincinnati's amusement parks, probably the Zoological Gardens, where concerts are given nightly. Thursday morning, when the men attend their opening session, the wives of the members of the local chapter will take the wives of the visiting delegates in charge for sight-seeing, shopping, the matinee and other features to occupy the three remaining days of the convention.

Saturday, the delegates will visit various Cincinnati electroplating institutions, particularly the large undertaking supplies factory of the **Crane & Breed Company,** which maintains an extensive electroplating department in charge of **William J. Husing,** who is secretary of the Cincinnati Chapter.

Thomas Buchanan, chairman of the local committee on arrangements, said that he expected to have programs in the mail, going to each member of the National society, by the middle of May. Approximately 500 delegates are expected to attend the convention, and the Queen City of the West, with its distinctive and important electroplating plants and its excellent facilities for entertainment will extend full measure of hospitality to the visitors. H. N. L.

The five New England branches of the American Electro-Platers' Society have appointed a committee to be known as the New England Convention Committee for the purpose of trying to secure the 1923 convention for Providence, R. I. The idea is to have the five branches co-operate, the convention to be held in Providence and be known as the New England Convention.

ROCHESTER BRANCH, A. E. S.

HEADQUARTERS, c/o S. P. GARTLAND, 128 BRYAN STREET

Because of the sudden death of E. E. Fitch, secretary of the Rochester branch, the banquet of that branch has been postponed from April 22, 1922 to May 13, 1922.

BRIDGEPORT BRANCH, A. E. S.

HEADQUARTERS, c/o G. J. KARL, 1505 FAIRFIELD AVE.

The Bridgeport branch of the American Electro-Platers' Society will hold their annual outing at "The Farm," Bridgeport, Conn., on Saturday, June 10, 1922. Games at 2 p. m. Dinner at 5 p. m. sharp. Tickets and detailed information can be obtained from G. J. Karl, 1505 Fairfield avenue, Bridgeport, Conn. Others on the committee are Wm. Flaherty, John Raull, Wm. Stratton, John O'Brender, Frank Spaine, Dave Fleming, Frank Toole.

Personals

Homer F. Staley, until recently metallurgical ceramist for the Bureau of Standards, Washington, D. C., has accepted an appointment as ceramic engineer to the Metal and Thermit Corporation, 120 Broadway, New York, in charge of its ceramic departemnt, which has placed on the market new grades of tin oxide. Mr. Staley graduated from the Ohio State University in 1904. From 1904 to 1905 he took advanced work in ceramic engineering at that university, also graduate work in chemistry at Columbia University during 1909 and at Ohio State University during 1910 and 1911. In 1905 he was appointed chemist for the McCrum-Howell Company, manufacturers of enameled iron sanitary ware. In 1906 he became superintendent of this plant. From 1909 to 1913 he served as professor of ceramic engineering at Ohio State University. At the end of that period he was made technical director for the Standard Sanitary Manufacturing Company, largest manufacturers of enameled iron ware in the world. A year later he became professor of ceramic engineering at Iowa State College. From 1918 to 1921 he was metallurgical ceramist for the Bureau of Standards in charge of sections on enameling metals and refractories. During the war he was technical adviser on ceramic problems to the War Industries Board.

Egmont L. Frankel, of Frankel Brothers, Toronto, Canada, was recently elected chairman of the Metals Division of the Waste Material Dealers Association. Mr. Frankel, who is thirty years old, became general manager of Frankel Brothers about three years ago. He has spent his entire business career with this firm since graduating from the University of Toronto in 1912, where he obtained the degree of Bachelor of Applied Science. Frankel Brothers are large dealers in scrap metals, iron and steel and also do smelting and refining.

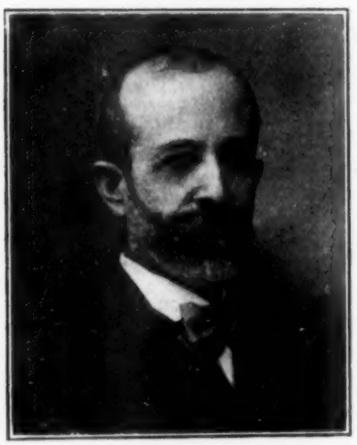
EGMONT L. FRANKEL.

A. F. Saunders, designer for the Benedict Manufacturing Company, Syracuse, N. Y., discussed "The Design and Manufacture of Silverware," at the meeting of the Technology Club of Syracuse, recently. Mr. Saunders is the author of articles on this subject published in THE METAL INDUSTRY.

Deaths

CHARLES F. MOLLEY

On April 7 Charles F. Molley passed away at the St. Joseph Hospital, Reading, Pa., in his 65th year. Though he did not have a strong constitution, he always seemed well and active. The news of his death was a shock to his friends and acquaintances. Pneumonia was the fatal illness.



CHARLES F. MOLLEY.

Mr. Molley was born in Pine Grove, Schuylkill County, Pennsylvania, June 25, 1857. He was the son of Charles Frederick and Elmina Molley. His father was a prominent contractor, having built some of the first railroads in the coal regions of Pennsylvania, and during the Civil War was the owner of the Franklin Furnaces located in Pennsylvania.

He was educated in Germany, having studied law. His first trip abroad was made at the age of 15 years, when he remained for one year. His second trip was made when he was 18 years of age and completed his studies covering a period of four years. His third trip was made in the Fall of 1905.

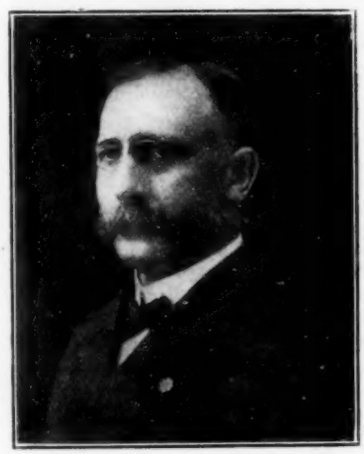
About 1905 he became the secretary of the Patriotic Association of America, and in this connection, became nationally known through his hard work in bringing the famous case of Theodore Ruggles Timby, inventor of the Revolving Turret, as used on the Monitor, before Congress for recognition.

In 1915 Mr. Molley took up the active management of the American Boron Products Company, Inc., manufacturers of boronized metal alloys. In the promotion of this enterprise he became very well known with metallurgical and chemical men of this and foreign countries. He was vice-president and general manager of this corporation, and to a great extent responsible for its growth, up to the time of his death.

Mr. Molley returned from a business trip to Baltimore, Md., March 30, and was not feeling very well, and on April 1 his case was diagnosed as pneumonia, and he was then removed from his apartments to the St. Joseph's Hospital of that city, where everything possible was done to hasten his recovery. But fate decreed differently and on the 7th of April, at 4:55 p. m., Mr. Molley passed away. Besides his wife, Marie (nee Wellander) Molley, he is survived by his son Robert E., of Reading, Pa., and one daughter, Frances, wife of Louis Lundquist, Peekskill, N. Y.

WILLIAM NEWTON BEST

William Newton Best, president of the W. N. Best Furnace and Burner Corporation, 11 Broadway, New York, died at his home, 974 Park Place, Brooklyn. He was sixty-two years old. Mr. Best was born in Quincy, Ill. He had devoted the greater part of his life to the development of devices for burning oil, and was the holder of numerous patents for inventions relating to the oil-burning industry. He was the author of "Science of Burning Liquid Fuel."



WILLIAM NEWTON BEST.

Mr. Best was a fellow of the Royal Society of Arts, London, and a member of the American Institute of Mining and Metallurgical Engineers, and the Institute of Metals Division of that society, the American Railway Mechanics' Association, the American Society of Mechanical Engineers, Long Island Lodge 382, F. and A. M., the Brooklyn Federation of Churches and the Congregational Club of Brooklyn. He was also vice-president of the Goodwill Industries of Brooklyn.

ELLSWORTH E. FITCH, JR.

After an illness, lasting less than a week, Mr. Ellsworth E. Fitch, Jr., age thirty-six, of 607 Sawyer Street, Rochester, N. Y., passed away at his home on April 19, 1922.

Mr. Fitch succeeded his father several years ago as superintendent of the polishing and plating department at the plant of the General Railway Signal Company, Rochester, N. Y. He held this position up until the time of his death.

He was a member of Genesee Camp, No. 8450, Modern Woodmen of America; also an active member of the Rochester Branch, American Electro-Platers' Society, which body he conscientiously and faithfully served for the past year as secretary and treasurer.

Mr. Fitch had worked painstakingly and faithfully for several weeks past in connection with arranging for the annual banquet of the Rochester Branch, American Electro-Platers' Society, which was to have been held at the Hotel Seneca, Rochester, N. Y., on Saturday, April 22. The banquet has since been postponed because of his death.

Besides a host of friends, who will greatly miss him, and to whom he had endeared himself, he is survived by his wife, Hazel C.; one son, Ellsworth E., of Rochester; his parents, Mr. and Mrs. Ellsworth E. Fitch, Sr., and one brother, Raymond F. Fitch, all of Buffalo, N. Y.

The funeral was from the residence on Saturday afternoon, April 22 at 2 P. M. Burial at Riverside Cemetery, Rochester, N. Y.

ALBERT E. JOSEPH

Albert E. Joseph, a member of the firm of Thomas J. Nichol and Company, brass manufacturers of Cincinnati, Ohio, died of heart disease in the Lenox Hotel, 149 West Forty-fourth Street, New York, on April 8. He was acting as traveling salesman for his concern. His death occurred on the day after his forty-sixth birthday. Within a week Mr. Joseph was to have married Mrs. Rosa Sakman, of 340 East Fifth Street, Brooklyn. When he did not keep an appointment with her at 3 o'clock on the afternoon of April 8, she telephoned the hotel to learn if he was ill. She was told that he was dead.

Mr. Joseph had suffered from heart trouble for some time. Friends at the hotel with whom he chatted before retiring noticed that he looked fatigued. He leaves his mother in Los Angeles, and several married sisters in Cincinnati. His home was 616 Delta Avenue, Cincinnati.

GEORGE W. BLAKE

George W. Blake, president of the Buckeye Aluminum Company, Wooster, O., died February 6, 1922, following an operation for appendicitis. He was thirty-six years old.

JOHN H. ROBINSON

John H. Robinson died at the home of his son, H. M. Robinson, 99 Fremont Street, Bridgeport, Conn, on March 11. Mr. Robinson was injured in an automobile accident on December 8, and had never fully recovered from the effects. He was born in Belfast, Ireland, seventy-four years ago.

He was the founder of the Fairfield Aluminum Foundry, and was also with the American Graphophone Company, where he worked in the capacity of foreman of inspection, which position he held until a short time ago. He was well known in church and Masonic circles, being a member of St. John's Blue Lodge, F. and A. M. He is survived by eight children.

TRADE NEWS

BUSINESS REPORTS OF THE METAL INDUSTRY CORRESPONDENTS

WATERBURY, CONN.

MAY 1, 1922.

Local industrial conditions in brass and allied industries are slowly but surely on the mend according to the concensus of opinion of representatives of practically all the local factories.

Richard D. Ely, representing the **Chase Companies,** stated that times were better than they were a few months ago, and that the Chase Companies now had many more men working than they did a month ago. He thought the outlook for the future was very encouraging.

E. H. Yates, of the **American Brass Company,** characterized the present situation as an indefinite one. He said business was fair but that it had not picked up to any great extent. Some lines were good, he said, while others were not so good. He held out hopes that conditions would better themselves or at least become more settled within a short time.

E. O. Goss, of the **Scovill Manufacturing Company** said, "Business has improved and that is all I care to say." At the **Mattatuck Manufacturing Company** it was reported that business was gradually becoming better. **Plume & Atwood's** declared the present condition a healthy one. While business hadn't picked up to any great extent it had been gradually on the mend for months.

At the **Steele & Johnson** plant it was reported that conditions were much better now than a year ago and that business was improving each month. The **Waterbury Buckle Company** reported that things were going along at present pretty much as in the past, but that the number of inquiries received concerning prices of various articles indicated that the future should bring more business. The **Waterbury Button Company** is manufacturing considerable radio equipment and consequently is very busy in this line although the button business itself is very poor, due principally to the fact that the making of buttons is governed by the changes in fashion and fashion this year does not call for many buttons.

It was reported at the **American Pin Company** plant that the volume of business at the present time is greater than it has been in months. Much of the business, however, is not of the most satisfactory type, due to the close prices necessary, with comparatively little profit, and the still existing high prices of materials. Much of the company's output at the present time consists of household supplies, such as plumbing fixture rather than pins.

The **Waterbury Clock Company** reports that conditions have changed but little as far as their business is concerned. It was stated at the **Oakville Company** plant that business has shown a steady improvement during the past several weeks, and that the concern is going along very comfortably now. Although not hiring a large number of men they are taking good care of those at work there and giving work to a few extra employees. The **Bristol Company** stated conditions to be much better at the present than a month ago and the future to be a bright one. The **Blake & Johnson** works are running full time and conditions are better than recently. The **Randolph & Clowes Company** reported that conditions were better than they had been and that the future is looked forward to with optimism. Although conditions at the **Waterbury Farrel Foundry & Machine Company** are by no means normal, business for the past three months showed a decided improvement over the previous months.

The **Waterbury Clock Company** took full possession of the plant and assets of the bankrupt **Robert Ingersoll & Brother** watch concern this month, after sale of the assets had finally been confirmed by the federal court. William J. Larkin and Clifford H. Hall, of the Clock Company, took over the local Ingersoll plant on West Dover St.; Harry B. Dow, of the Clock Company, took over the plant in Trenton and rep-

resentatives of the Clock Company in New York and Chicago took over the Ingersoll assets in those cities.

Col. G. W. Wickersham, counsel for the Ingersoll's, gave notice of appealing from the order of sale, after failing in his attempt to block the actual passing of the $1,500,000 paid for the assets.

Waterbury manufacturers are not satisfied with tariff bill before Congress. **John H. Goss**, of the Scovill Manufacturing Company, predicts that the so-called Connecticut plan for American valuation will be eventually decided upon. He was a member of the Connecticut Chamber of Commerce which recently drafted this plan. He believed it the proper solution, not because it was the Connecticut plan, but because it seemed the most logical plan for handling the question of exchange.

The Connecticut plan modified the American valuation plan by providing that to meet any hardships to manufactures, importers or consumers which may be caused by abnormal rates of exchange and unsettled conditions ot foreign markets, Congress establish for the purpose of changing said rates from time to time and relieving said hardships, such agencies as in their judgment may be effective for the purposes and permissable under the constitution. In a word, it is the belief that Congress should determine the basis of valuation and "peg" the rate but that some other agency should be empowered to modify it to meet emergencies or fit changing conditions. W. R. B.

BRIDGEPORT, CONN.

MAY 1, 1922.

Brass, metal and practically all lines of industry showed a small but marked improvement this month over last. Both in number of orders and in employment signs point to a gradual but steady increase which seems to be of permanent nature. Improvement in the unemployment situation is indicated by the decrease of applications for relief from more than 100 a day to 20 a day which has resulted in the laying off of five investigators employed by the charities department. Hundreds of unemployed men who relied upon the aid given them by the charities department for support during the winter months now have been placed in positions in shops, state road work and on farms and are self supporting.

The office of the **Underwood Typewriter Company** reports March sales in both foreign and domestic markets have been good, with results realized in the domestic market particularly encouraging. Sales made through the Chicago office being especially noteworthy. Export business to European, South American and Far Eastern countries has shown promising improvement when compared with the records of the forepart of the year.

The first fruits of the Boost Bridgeport campaign instigated by the chamber of commerce are shown in the bringing to the city of one new manufacturing establishment and the prospects of several more to follow as forecast in these pages last month. The new firm to locate here is the **Harriman Radio Manufacturing Company**, makers of radio appliances.

The coal strike has worked no hardship and seems likely to cause none in Bridgeport, as the manufacturers and coal dealers, foreseeing the trouble, stocked up with sufficient supplies to meet their needs for the next two months before the strike was called. The fact that the winter was comparatively mild and the fact that factories which in former years used up large amounts of coal have recently been operating on part time schedules have resulted in good sized surpluses being on hand.

New interests were added to the board of directors of the **Columbia Graphophone Company** at the annual meeting of stockholders held recently. Many of the directors on the new board represent creditors.

One of several plans for reorganization of the **Locomobile Company** under which a new organization to purchase the assets of the company is proposed will be discussed at a meeting to be held this month of the creditors' committee of the company. Any plan will be subject to the approval of the federal court. **Donald Davis**, chairman of the committee and president of the **Liberty Industrial Corporation** is expected to outline the proposed reorganization plan. The output of the company is constantly increasing as orders for new new cars continue to come in. The company is making parts for service purposes as well as putting out new cars.

The city is considering acquiring several dormitories built by the **Remington Arms Company** during the war for high school purposes. They were sold to a New Haven firm a year ago for $19,000 and $24,000 each. W. R. B.

TORRINGTON, CONN.

MAY 1, 1922.

The **Turner & Seymour Manufacturing Company** has elected the following directors: Luther G. Turner, Francis H. Griffiths, W. W. Cotter, George H. Atkins, Mason Turner, E. E. L. Taylor and Wadsworth Doster. Representatives of the American Brass Company, who were identified with the Turner & Seymour company for several years, withdrew from the board. The election of the new board took place at the annual meeting on April 25.

The directors elected Luther G. Turner, president; George H. Atkins, vice-president; Francis H. Griffiths, treasurer, and Mason Turner, secretary, and reappointed W. W. Cotter, works manager.

A daylight saving schedule for Torrington factories was approved by the manufacturers at a meeting April 24. The new schedule went into effect April 30 and the rest of the town fell in line.

Frank M. Travis has been elected president of the Maria Seymour Brooker Memorial to fill the vacancy caused by the death of James A. Doughty, who had been president of the Memorial since its organization. John A. Coe was elected a member of the board of managers to fill out Mr. Doughty's unexpired term. Resolutions on the death of Mr. Doughty were adopted.

The **Torrington Building Company** has been awarded the contract for the addition to another story to the plating building of the **Excelsior Needle** plan of the **Torrington Company.** The plating building at present is only one-story high. It is 150 feet long, of brick construction. Rapid progress is being made in the construction of an addition to the **Union Hardware** plant.

Thomas W. Bryant, president of the **Union Hardware Company** and widely known in metal industrial circles, has been appointed deputy judge of the Torrington borough court, succeeding George H. Atkins, who was retired by age limitation.

Gail Q. Porter has resigned as manager of the National Sweeper division of the Torrington Company to accept a similar position with **Landers, Frary and Clark**, of New Britain. He has also resigned as vice-president and treasurer of the **Domestic Vacuum Company**, a subsidiary of the Torrington Company.

Luther G. Turner, of the Turner & Seymour Company, has returned from the south, where he spent the winter. Mrs. Turner and his daughter, Miss Marjorie, accompanied him. J. H. T.

NEW BRITAIN, CONN.

MAY 1, 1922.

Reflection of a genuine improvement in business conditions in the local factories is shown in the fact that the city, which several months ago undertook a big engineering project in order to provide work for the unemployed, is now having difficulty in securing enough men to work. Inquiry at several of the local factories resulted in the information being given out that business was gradually picking up. At the Stanley Works, makers of wrought steel butts and hinges and also dealers in both hot and cold rolled steel, Secretary Ernest W. Christ stated that "our hardware business is fine" and it appeared that business generally was picking up.

At the **P. & F. Corbin** division of the **American Hardware Corporation** business is really good. Building throughout the country is increasing and with this comes an increase in the demand for builders' hardware. There is also a brisk South American trade.

The **North & Judd Manufacturing Company** is actually having to hustle to keep up with its business. **Landers, Frary & Clark** is likewise showing improvement and the demand for cutlery as well as other domestic articles and electrical appliances is brisk.

One of the most important features among New England manufacturers is the reorganization of the **New Britain Machine Company,** effected at a meeting on March 31. Vice-president Abram Buol, who has been with the concern for 27 years, has consistently opposed the policy of President H. H. Pease and at the meeting March 31, Mr. Buol was dropped as a director and as vice-president. He immediately announced that he would leave the concern on April. The new directorate is E. Allen Moore, president of the Stanley Works; A. W. Stanley, Stanley Rule & Level Company; Leon T. Broadhurst, president of Phoenix Bank, Hartford; Edward M. Day, Hartford; John E. Otterson, president Winchester Repeating Arms Company; P. B. Stanley, vice-president Stanley Works; W. S. Rowland, president Stanley Chemical Company; H. H. Pease, president New Britain Machine Company; Paul K. Rogers, treasurer Skinner Chuck Company; John H. Goss, president Scovill Manufacturing Company, Waterbury.

The annual statement showed a deficit of $1,456,542.58. Reports presented also showed that the factory was operated at a loss of $240,000; and the assets dropped from approximately $3,000,000 to about $1,650,000. President Pease states however, that his company is now in an admirable position to take advantage of any rise in business. H. R. J.

ROCHESTER, N. Y.

MAY 1, 1922.

The advent of real spring has served to stimulate increased activity in business and industrial lines in Rochester. From excellent sources, it is asserted that since the first of the month, nearly 1,000 workmen have been added to the payrolls of various metal-using plants about the city. This item is quite significant of a gradually increasing industrial output and a sure sign of a return to normalcy.

There is a certain degree of improvement in industrial conditions at all of the various plants assembled under the **Eastman Kodak** organization, as well as at the **Bausch & Lomb** optical works. There is increased activity at the Yawman & Erbe plant, and at the **General Railway Signal** works in Lincoln park. The foundries of the **Northwest Foundries, Inc.,** have nearly doubled their output during the past month. In all of the various machine shops and metal-plating works there is a pronounced improvement in industry.

The plating industry in Rochester is said to have been greatly stimulated by the fact that spring has developed unusually heavy building operations in the city. Much remodeling in proceeding in large structures in the down-town business district, which fact has created a demand for brass, copper, tin, lead and bronze. Steel fixtures with nickel-plating are in firm demand. G. B. E.

TRENTON, N. J.

MAY 1, 1922.

Manufacturers in Trenton report an increase in business and the prediction now is that the spring and summer months will see another gradual pickup along business lines. Manufacturers say that the atmosphere will be clearer when labor and railroad rates are further adjusted and the coal strike settled. While a few more orders are coming in, yet conditions are far from normal in some of the plants.

The **Trenton Zinc & Chemical Company** will shortly issue preferred stock to the amount of $50,000 par value, bearing dividends at the rate of $4 a share, according to a resolution of the board of directors filed in the office of the Secretary of State at Trenton. The company stated that it would issue the new stock at $55 a share, plus accrued dividends to defray indebtedness incurred and to permit it to carry out its plans for developing its plant.

The **Citron-Byer Company,** Trenton, N. J., has been incorporated with $125,000 capital to engage in the business of metal dealers.

United Distributing Company, of Union Hill, N. J., has been incorporated at Trenton with $125,000 capital to deal in lamps, etc. The incorporators are Sarah Rosenthal, West Hoboken; Doris A. Youngman, Jersey City, and Rice Press, New York City, are the incorporators.

The **American Copper Products Company,** Bayway, N. J., is operating every department on full time. The business of the concern has picked up considerably during the past six months. Ordinarily, the plant turns out between 4,000,000 and 5,000,000 pounds of copper in a month, the increase in orders being due to the radio craze that is sweeping the country.

The **American Typefounders Company,** of Jersey City, has purchased a factory site at Elizabeth, N. J.; and when industrial conditions begin to improve the concern will break ground for the erection of a modern factory. President Nelson recently returned from a tour of the country and said he found conditions in the west picking up.

High Tension Transformer & Equipment Corporation, of Hoboken, N. J., has been incorporated at Trenton with $400,000 capital to deal in electrical apparatus and appliances.

Vice Chancellor Fielder has appointed Frank H. LaPierre permanent statutory receiver for the Archibald-Klement Company, Inc., manufacturers of jewelry. The company has liabilities of $50,000, of which amount about $40,000 was represented by promissory notes. The factory was closed some time ago.

Jacob Wirtschafter has been made general manager of the **Trenton Quality Lamp Company,** which will shortly erect its second plant at Trenton. C. A. L.

PROVIDENCE, R. I.

MAY 1, 1922.

The close of the first four months of the year 1922 finds business among the metal trades giving evidences of a slight tendency toward a revival of activity throughout Rhode Island.

It would border dangerously on exaggeration to say that the metal industry in which so much Rhode Island capital is invested, and in which so many of the State's skilled workers, especially in Providence, are employed in normal times, is beginning to boom. It is certainly true, however, that business is picking up.

That business is on the upward trend is evident judging from the reports made by **H. J. Astle & Company,** of this city, as to the amount of business it has been doing during the past few weeks, especially in connection with the installation of Boland systems in various factories throughout the East. In the factory of McChesney Co., Newark, N. J., several Boland systems, including exhaust and dry dust collectors, polishing lathes, sinks, tanks, filtering systems and coloring room equipment, have been installed.

The manufacturing jewelry concern of **Payton & Kelley Company,** of this city, has filed formal notice according to law with the Secretary of State that it has increased its capital stock from $100,000 to $200,000.

ARMY ALL-METAL AIRPLANES

The recent completion of two types of all-metal airplanes for the United States Army and the big nacelles containing the Gallaudet multiple drive for the navy, marked an era in the history of the Gallaudet Aircraft Corporation at East Greenwich. The success of these types, all of which have been highly commended by the authorities at McCook Field, Dayton, Ohio, and the Naval Aircraft Factory at Philadelphia, was the signal for the issuance of another contract to the Gallaudet Corporation.

This new contract which reflects the progressive methods of the Army Air Service, provides for the development and manufacture of another new type of monoplane designated as the D. B. 1B which reduced to common every day terms signified Day Bomber, refined model, all-metal internally braced and fabric covered. The consideration mentioned in the new contract is $150,000. This machine modified into a commercial plane with Liberty motor, it is said, could carry a commercial pay load of over a ton.

The Gallaudet factory at East Greenwich, always a busy

place, it is reported, has taken on added activity and although it will be at least four months before the actual production of the new machine is started, the engineering force has already begun working full time on the preliminary drawings of the designs.

The **Atlas Sheet Metal Works**, 237 Dyer street have the contract for the sheet metal work on the new Jewish synagogue on Douglas avenue, this city.

The contract for all the sheet metal work on the new factory building "Manucentre" on Allen's avenue has been awarded to the **Strauss Company**, 370 Richmond street.

The annual report of the Board of Directors to the **Gorham Manufacturing Company** presented at the recent annual meeting of the stockholders showed marked changes from last year's report, there being a deficit on Jan. 31, 1922 of $284,-179.40 as compared with a profit and loss surplus of $157,-485.20 at the end of the previous year.

At the meeting of the new board of directors following the stockholders' meeting, the following were elected officers of the Gorham Manufacturing Company for the ensuing year. President, Franklin A. Taylor; vice-president and treasurer, Alfred K. Potter; secretary and assistant treasurer, William S. Stone; assistant treasurer, Ford Moran; comptroller, Alfred E. King. W. H. M.

CLEVELAND, OHIO

MAY 1, 1922.

Despite the fact that a building strike was in progress, employment conditions for the past month show steady improvement. Metal industries other than iron and steel show an increase of nearly two per cent, while iron and steel lead the list with a five per cent increase.

More than 35,000 letters were received in the prize contest conducted by the **Cleveland Metal Products Company**, says G. M. Davis, advertising manager. The contest offered $5,000 in prizes to the writers of the best letters concerning the utility of oil stoves, and the suggestions embodied in the great mass of answers will be used as the basis for an extensive advertising campaign. Besides the cash prizes a great quantity of aluminum ware was given to the winners.

Automobile production locally has increased fully 25 per cent during the month of March, according to available reports from the different plants. Trucks and parts have also shown sizeable increases.

The latest entry into the local automobile field is the **Sterling-Knight Company**, which recently purchased a modern plant for around $1,000,000. The company is an organization of Cleveland capital and will manufacture a car containing a new motor perfected by J. G. Sterling, formerly chief engineer of the F. B. Stearns Company. Deliveries will start in August. The firm reports a waiting list of over 200 at the present time. Manufacturers and dealers in the Cleveland district report that the brass demand is now twice what it was a year ago.

The first company to sell brass and copper products exclusively in this territory, the **Ohio Chase Company**, has opened a new warehouse where products of the **Chase Rolling Mill** and the **Chase Metal Works**, of Waterbury, Conn., will be handled. In this connection it is interesting to note a recent statement by a local leader who said that every important brass mill in the country has at least one representative who makes Cleveland his headquarters.

One local mill, the **National Copper and Smelting Company**, now is operating close to capacity. The other mills including the **Cleveland Brass and Copper Company**, and the **United States Copper Products Company** have suspended operations for the present, although developments may be expected shortly. C. C. C.

DETROIT, MICH.

MAY 1, 1922.

A rather peculiar situation seems to exist in practically all branches of the metal industry here. While business has shown a decided revival within the last six or eight weeks, collections seem to be about as hard as they were in December last. Money comes hard everywhere, and more or less complaint is heard about slow payments. The banks, however, are somewhat more liberal and are financing many concerns. It is confidently expected, however, that conditions will change for the better quite rapidly a little later on when payments for the manufactured product begin to come in.

Most of the great manufacturing concerns have reduced their inventories within the last year or so and are now very close to pre-war time conditions, when it comes to values. There is hardly a financial statement that does not show a considerable reduction in assets and usually with more or less of a reduction in liabilities. The automobile industry is running strong with prospects of good business for many months. The report is not quite so good in the adding machine and stove industry. The **Ford Motor Company**, at present, is adding 5,000 more men to its plants in Highland Park and on the River Rouge. Other plants are taking on thousands until now the employment situation here is greatly relieved. Skilled workmen are in considerable demand while common labor is being well looked after.

Of course the greatest showing is being made by the automobile companies, although there is an encouraging advance in the plumbing and trolley wheel manufacturing business. Many concerns are turning to the production of wireless outfits. This industry is coming strong with a future that no one can forecast, owing to its youth. F. J. H.

LOUISVILLE, KY.

MAY 1, 1922.

Although there is nothing in prospect from the brewers or distillers there is some fair business coming from the building and industrial lines. General sheet copper work is scarce, but there is some coil work being done. Building operations are heavier than ever before, March and April having been very big months, while there is over $10,000,000 in new work that is about to be contracted, one or two first class big jobs having been placed in the past few days, including the million and a half dollar warehouse and office building of the **Belknap Hardware & Manufacturing Company.**

General labor conditions in the state are easy. The Kentucky coal mines with but few exceptions are running full. An argument is pending over renewal and increase of a plumbers' wage scale here. The steam fitters recently adjusted the old wage. There is considerable trouble at Newport, Ky., as a result of strikes of steel and metal workers. As a rule things are in good shape.

The **Dosch Chemical Company**, Louisville, which purchased and equipped the old Bernheim distillery plant as a chemical manufacturing as well as sprayer assembling plant, is planning eventually to put in its own foundry, machine shops, etc., for manufacturing hand operated and horse drawn dusting or spraying machines. For the time being it is having castings made in local brass and metal working shops.

The demand for plumbing supplies has been so heavy that the **Ahrens & Ott** division of the **Standard Sanitary Manufacturing Company**, Louisville, has been operating at full speed.

Louisville jobbers and manufacturers of plumbing supplies report that general demand is heavier than for years past as a result of the very heavy building movement. Manufacturers of brass valves and goods of this character are said to be generally busy.

Fair business is reported by **W. G. Buschemeyer** and other manufacturing jewelers of Louisville, there having been a steady demand for special made up work, largely in platinum and white gold.

Matt Corcoran & Sons report better business the past few months, having had fair volume on copper candy kettles and equipment including fire and steam jacket types. A. W. W.

MONTREAL, CANADA

MAY 1, 1922.

The general business situation has improved somewhat during the past month and there is a much better tone in the

trade. Manufacturers, jobbers and dealers feel a little more confident and are beginning to realize that the process of improvement is going to be gradual. Some were looking for big things in April but the movement so far this month has shown them conclusively that they were over optimistic.

Contractors are making excellent headway in their building operations, these consisting largely of apartment buildings and structures to be used for the dual purpose of business and residence.

Scrap metals in the non-ferrous lines show no improvement. The fact that ingot metals have strengthened may create a better demand. Business locally has not shown any very marked improvement as yet and some even doubt whether the strengthening tendency of ingots will influence scrap until business picks up in the foundries.

The **Marconi Company of Canada** are manufacturing individual wireless sets at their factory on William street in response to the tremendous demand that is springing up. They are turning out ten sets per day and will gradually increase their output. P. W. B.

BIRMINGHAM, ENGLAND

APRIL 15, 1922.

Little if any improvement in the position of the British metal trades has yet taken place. Some increase in export business, chiefly to Australia, is reported, but against this has to be set the sudden closing of the South African markets owing to the Rand labor troubles. A number of orders for mining plant, electrical material, and brass fittings have been cancelled or suspended. Although the measures taken by the Dominion Government to quell the disturbances have proved fully effective it will be some time before the recovery of trade with South Africa recommences. There is rather a better demand for water and sanitary fittings for South America. The revival of the Indian market for brassfoundry has been checked by a renewal of financial difficulties in that dependency. New Zealand has been asking lately for more builders' and plumbers' brassfoundries. In the home market cabinet brassfounders are suffering from stagnation in building and in the furniture trades. Metallic bedstead manufacturers are making little demand on the brass trade, as their export trade has not yet shown any revival. The rolling and tube mills are still very short of employment. In the jewelery trade, for which 1921 was the worst year on record, no improvement is yet visible. Electroplaters are a little better employed than at the beginning of the year. Two or three firms in Birmingham have introduced the manufacture of brass taps by hot stamping which is said to be not only more economical as employing more unskilled labour, but also more efficient than casting. A similar movement is rapidly growing in heavy cabinet brasswork. H.

Business Items—Verified

The **Block Can Company,** 18-20 East Kinzie Street, Chicago, Ill., manufacturers and dealers in sheet metal, steel, iron, tin, copper, etc., has been incorporated with a capital of $10,000.

Maas and Waldstein Company, manufacturer of the well-known M. & W. lacquers and enamels, has removed its offices from 92 William street to larger quarters at 45 John street, New York.

The **Phelps, Dodge Company,** 99 John street, New York, has reported a net loss of $8,539,068, after interest charges, depletion, depreciation, and taxes were paid for 1921.

The **International Blower Company, Inc.,** Hartford, Conn., has purchased the entire business of the Connecticut Blower Company, of Hartford, Conn., including the machinery, tools, stock, equipment, etc., and has moved it to the factory at 345 Trumbull street. The International Blower Company has a capital of $50,000. C. H. Keeney is president.

The **International Nickel Company** has decided to close one of its Bayonne, N. J., plants, so that manufacturing operations may be carried on more economically. Part of the equipment will be transferred to the new plant at Huntington, W. Va., being erected at a cost of $3,000,000; part will be removed to a new refinery at Port Colborne, Ont., Canada, and part will be transferred to the other Bayonne plant, which will continue operating. The New Huntington plant is for rolling nickel and Monel metal.

The **Electric Furnace Company** has mover its general and sales offices from Alliance, Ohio, to Salem, Ohio. By this action all departments of the company will be consolidated at its works, Wilson street and Pennsylvania Railroad, Salem, Ohio.

W. H. Campbell, formerly general sales manager of the **Charleston Industrial Corporation,** Nitro, W. Va., announces the opening of offices for the sale of new and carefully inspected used chemical, refrigeration and power apparatus, under the name of **W. H. Campbell, Inc.,** at 30 Church street, New York.

The **Zeller Lacquer Manufacturing Company** has enlarged its offices in the Canadian Pacific Building, 342 Madison avenue, New York, which was necessitated by increase in business done. The additional space is for the accounting and clerical departments but a stock of standard grades of Zeller lacquer in small containers will also be carried for the convenience of customers. The plan is eventually to establish a large display room, to exhibit finishes on a large variety of goods.

The **Standard Underground Cable Company,** Westinghouse Building, Pittsburgh, Pa., has made a denial of the rumor that it intended to build a copper rod rolling mill at Seattle, Wash.

In the latter part of March, a number of department heads and officials of the various branches of the **American Brass Company,** were the guests of **Anaconda Copper Mining Company,** at Butte, Mont., where they enjoyed a comprehensive inspection trip through the Anaconda mines and smelters, under the guidance of the mine managers.

The **Lebanon Brass Manufacturing Company,** Second and Guilford streets, Lebanon, Pa., has been incorporated with a capital $10,000, by Howard Desch, and Frank H. Wise. It operates a brass, bronze and aluminum foundry, tool room, grinding room, casting shop, plating, polishing, lacquering, japanning, and enameling departments, and does a job plating business.

The **Acme Brass and Machine Works,** 609 East 17th street, Kansas City, Mo., plans to erect a two-story plant building at an estimated cost of $15,000. It operates a brass machine shop, brazing, soldering, plating, polishing and lacquering departments.

The **Artistic Metal Products Corporation,** 776 Broad street, Newark, N. J., has been incorporated with a capital of $100,000. It is made up of mechanical and electrical engineers, and metal workers, operating a bronze foundry, tool room, casting shop, spinning, stamping, soldering, plating, polishing, japanning, and lacquering departments.

The **Greenduck Metal Stamping Company,** Van Buren and Hoyne avenues, Chicago, Ill., has been incorporated for $100,000, and is the successor of the former Greenduck Company, and owner of their plant and dies. It does white metal casting and stamping of a great variety of specialties and novelties and operates a tool room, grinding room, and stamping, soldering, plating, polishing, japanning and lacquering departments.

The **Atlas Die-Casting Company,** Worcester, Mass., has been incorporated, with J. Herbert Johnson, recently assistant sales manager of the machine division of the Norton Company, as general manager and treasurer. Edwin G. Norton is president, and the other directors are Nathan Lester, Malcolm A. Blanch, and Harry Smith. Mr. Lester is the engineering member of the executive staff. He was formerly with the Doehler Die Casting Company, and the Acme Die Casting Company, both of Brooklyn. Mr. Blanch is superintendent. The business has been established one

year. The company is located in the four-story building at 29 Jackson street, Worcester, where it has installed new equipment for the manufacture of die castings of zinc and aluminum. Twenty die-casting machines will be in operation in a few weeks. The corporation has a capital stock of $200,000.

Bids will be received by the **Philadelphia District Ordnance Salvage Board** May 18, 1922, and May 25, 1922, for various lots of copper bands and brass extrusion cups located in New York and New Jersey. For information write to the Chairman of the above Board.

Notices have been posted in the shop of the **Ansonia Manufacturing Company,** announcing a 15 per cent wage increase to go into effect May 15. The company manufactures brass goods. Between 500 and 600 employes are affected. The company cut wages about a year ago, promising at the time to raise them as soon as business conditions justified.

The **Metal Sales Company,** Arch street, Philadelphia, Pa., represents the Seymour Manufacturing Company, of Seymour, Conn., and the Wheeler Condenser & Engineering Company, Carteret, N. J., selling brass sheet, rod and wire; nickel silver; phozhor bronze; seamless brass, and copper tube. F. G. Lehmann is the manager.

A fire, which started in an adjoining factory, did considerable damage to the job electro-plating plant of **Philip Sievering,** 402-412 Broome street, New York. Most of the machinery and mechanical apparatus escaped serious damage, however, and the plant was soon in operation again.

The **Wayne Oil Tank and Pump Company,** Fort Wayne, Ind., has recently purchased the Borromite Company of America, manufacturers of water softening systems, and changed its name to **Wayne Tank and Pump Company.** The Borromite Systems will be known as the Wayne Water Softening Systems.

The **Goshen Lightning Rod Company,** of Goshen, Ind., manufacturers of lightning rod cable and fixtures, are adding up-to-date plating and polishing equipment to their factory and contemplating doing outside plating as well as their own. Edward Wambaugh is in charge.

Proposed Tariff Schedule

The following is the tariff schedule as presented before the Senate, compared with the House Bill and the Underwood Law, now in force. Most of the items of interest to the metal and plating trades are given.

SCHEDULE 1.

	Senate Bill	House Bill	Present (Underwood) Law
Boric Acid (lb.)	1½c.	2c.	¾c.
Alcohol—			
Amyl, Butyl, Propl (lb.)	3c.	6c.	¼c.
Fusel Oil (lb.)	2c.	6c.	¼c.
Methyl (wood) (gal.)	10c.	15c.	Free
Potash Alum (lb.)	¾c.	1c.	15%
Ammonium Chloride (lb.)	1¼c.	1¼c.	¾c.
Ammonium Sulphate (lb.)	¼c.	3-5c.	Free
Argols (under 90%) (%)	5	5	5
" (over 90%) (lb.)	5c.	5c.	2½c.
Cobalt Salts and Cpds. (%)	30	25	15
Acetates of Lead—			
White (lb.)	2½c.	3¼c.	1¼c.
Brown, Gray, Yellow (lb.)	2c.	2¼c.	1c.
Other Lead Cpds. (%)	30	30	20
Phosphorus (lb.)	8c.	10c.	Free
Chromium Colors (%)	30	25	20
Potassium Carbonate (lb.)	¾c.	25%	Free
Potassium Hydroxide (lb.)	1c.	25%	Free
Sodium Carbonate (lb.)	¼c.	¼c.	Free
Sodium Hydroxide (lb.)	½c.	½c.	¼c.
Sodium Nitrate (lb.)	3c.	3c.	½c.
Sodium Phosphate (lb.)	½c.	½c.	¼c.
Sodium Silicate (lb.)	⅜c.	⅜c.	Free
Sodium hydrosulphite (%)	35	35	15
Tin Salts (%)	25	20	10
Zinc Sulphate (lb.)	¾c.	¾c.	½c.

SCHEDULE 3. METALS AND MANUFACTURES OF METALS.

	Senate Bill	House Bill	Present (Underwood) Law
Cerium Metal (lb.)	$2.00	30%	30%
Cerium Alloys (lb.)	$2+25%	30%	15%
Alum. Household Ware, (lb.)	15c.+60%	28%	25%
Copper and Brass—			
Household Ware (%)	50	35	20
Metal Buckles (per 100)	5-15c.+20%	5-15c.+20%	15%
Metal Hooks and Eyes (lb.)	4½c.+25%	4½c.+15%	25%
Metal Trouser Buttons (grs.)	1-12c.	1-12c.	15%
Aluminum, Crude (lb.)	5c.	5c.	2c.
Aluminum, Plates, Bars, etc. (lb.)	9c.	9c.	3½c.
Magnesium, Metallic (lb.)	50c.	$1.00	25%
Antimony Metal (lb.)	2c.	1½c.	10%
Bismuth (%)	7½	Free	Free
Cadmium (lb.)	15c.	Free	Free
Liquated Antimony (lb.)	¾c.	Free	Free
German Silver (%)	20	20	15
Nickel Silver (%)	30	20	15
Copper Rolls (lb.)	2½c.	2½c.	5%
Copper, Engrs. Plts., not grd. (lb.)	7c.	7c.	5%
Ground (lb.)	11c.	11c.	5%
Brass Rods, etc. (lb.)	4c.	4c.	20%
Seamless Brass Tubing (lb.)	8c.	8c.	20%
Brazed Brass Tubes (lb.)	12c.	12c.	20%
Bronze Rods and Sheets (lb.)	4c.	4c.	20%
Bronze Tubes (lb.)	8c.	8c.	20%
Bronze Powder (lb.)	16c.	16c.	25%
Bronze Leafs (lb.)	8c.	8c.	25%
Gold Leaf (per 100)	60c.	50c.	35%
Silver Leaf (per 100)	5c.	5c.	30%
Tinsel Wire (lb.)	10c.+30%	10c.+30%	6%
Tinsel Bullions (lb.)	10c.+35%	10c.+35%	25%
Tinsel Ribbons (%)	45	45	40
Tinsel Fabrics (%)	55	55	40
Quicksilver (lb.)	25c.	35c.	10%
New Types (%)	25	15	15
Nickel in Pigs (lb.)	3c.	5c.	10%
Nickel Bars and Sheets (%)	25	30	20
Tin in Bars and Pigs	Free	2c. lb.	Free
Lead Bearing Ores (lb.)	1½c.	1½c.	¾c.
Lead Bullion and Pigs (lb.)	2⅛c.	2⅛c.	25%
Lead in Sheets (lb.)	2⅜c.	2⅜c.	25%
Zinc-bearing Ore—			
Under 10% Zinc	Free	Free	10%
10@20% Zinc	½c.	½c.	10%
20@25% Zinc (lb.)	1c.	1c.	10%
Over 25% Zinc (lb)	1½c.	1½c.	10%
Zinc in Pigs (lb.)	1⅝c.	1⅜c.	15%
Zinc in Sheets (lb.)	1¾c.	1⅝c.	15%
Zinc in Plated Sheets (lb.)	2c.	1¾c.	15%
Old Zinc (lb.)	1c.	1c.	15%
Print Rollers and Blocks (%)	45	30	20@50%
Other Metal Articles or Ware (%)	40	35	20@50%
Magnesium Alloys (lb.)	50c.+20%	$1.00+20%	25%

SCHEDULE 2.

	Senate Bill	House Bill	Present (Underwood) Law
Firebrick, unglazed—			
Under ten lbs. each (%)	15	10	10
Over ten lbs. each (%)	25	17	10
Firebrick, glazed—			
Under ten lbs. each (%)	30	20	15
Over ten lbs. each (%)	35	20	15
Magnesite Brick (lb.)	4-10c.+10%	¾c.+10%	10%
Chrome Brick, unglazed (%)	25	20	10
Chrome Brick, glazed (%)	35	23	15
All other brick (%)	25	15	10

Pumice Stone, Mfrd. (cwt.)	55c.	55c.	¼c. lb.
Pumice Stone Products (%)	35	26	25
Fluorspar (ton)	$5.60	$5.00	$1.50
Graphite, amorphous (%)	10	10	Free
Graphite, Lump (%)	20	10	Free
Graphite, Flake (lb.)	2c.	10%	Free

SCHEDULE 14. SUNDRIES.

	Senate Bill	House Bill	Present (Underwood) Law
Jewelry above 20c. per doz. pieces in value (%)	80	55	60
Ropes, chains, etc., not exceeding half-inch in diameter, valued above 30c. yard, smokers' articles, mesh bags, vanity cases, etc. (%)	80	55	60
Stamping, galleries and other materials of metal for manufacture of above articles (%)	75	45	50

FREE LIST.

	Senate Bill	House Bill	Present (Underwood) Law
Hydrofluoric Acid	Free	Free	Free
Hydrochloric Acid or Muriatic	"	"	"
Nitric Acid	"	"	"
Sulphuric Acid	"	"	"
Bells and Bell Metal to be remanufactured	"	"	"
Bismuth	7½%	"	"
Borax, unmanufactured, borate of lime, borate soda	Free	"	"
Brass and Dutch Metal for remanufacture	"	"	"
Bullion, gold or silver	"	"	"
Cadmium	15c. lb.	"	"
Calcium: Acetate, chloride (crude), nitrate, lime nitrogen	Free	"	"
Linotypes, typesetting machines, typewriters, shoe machinery, sand blast machines, oil-spreading machines	"	"	"
All other products of coal tar not specifically provided for	"	"	15% ad.v.
Composition Metal, copper chief component material	"	"	Free
Copper ore, copper cement, old copper for manufacture, bars, ingots, etc., not manufactured	"	"	"
Copper Sulphate, copper acetate and sub-acetate	"	"	"
Metallic mineral substances, crude and metals unwrought, not specifically provided for	"	"	10% ad.v.
Barium, calcium, sodium and potassium and alloys of which said metals are chief component	"	"	25% ad.v.
Cuttlefish Bone	"	"	Free
Ferrous Sulphate	"	"	"
Iridium, osmium, paladium, rhodium, and ruthenium and any combination thereof with platinum	"	"	"
Ores of gold, silver or nickel, nickel matts, ore of the platinum metals, sweepings of gold and silver	"	"	"
Platinum, unmanufactured or in ingots, bars, sheets or plates not less than ⅛-inch in thickness, sponge or scrap	"	"	"
Potassium Chloride, Potassium Sulphate, Kainite, Wood Ashes, Beet Root Ashes, and all crude Potash Salts, not specifically provided for	Free	Free	Free
Cyanide	10%	"	"
Sulphur in any form, sulphur ore containing 25% sulphur	Free	"	"
Tin ore and black oxide of tin	"	"	"
Tin in bars, block or pigs and grain or granulated and in scrap tin	"	2c. lb.	"

GOVERNMENT SCRAP METAL SHOP

Congress may be called upon to provide capital for the largest junk dealing business in the world if one of the plans receiving serious consideration from American naval experts for scrapping the battleships doomed by the Naval Treaty is adopted.

A fund estimated as high as $75,000,000 may be needed to carry out a scrapping plan which technical experts say would eventually prove to be the most economical way of disposing of these ships, particularly the old ones. This proposal provides that the Government itself shall undertake the gigantic task of breaking up the seventeen old battleships slated for destruction, and new ones as well, at least those building in navy yards.

The advantages of this plan, the experts say, are that it will provide employment for some of the skilled and many of the unskilled workmen recently furloughed from the yards, and that it will be possible for the Government to carry out the scrapping in accordance with the treaty terms but to store the scrap metal, steel and brass, until the present price depression is over..—N. Y. Times, April 3, 1922.

SCRAP METAL FREIGHT RATES

Effective August 27, 1921, the Trunk Line roads established westbound rates on Scrap Lead from the territory east of Buffalo and Pittsburgh to the territory west thereof on the same basis as Pig Lead

A supplement cancelled the commodity rates on Scrap Lead, effective April 20, 1922, from all of the territory, except from Elizabeth, N. J.; Kingston, N. Y.; Newark, N. J.; New York Harbor Points, Perth Amboy, N. J., and Central R. R. of N. J. stations, New York Harbor to Elizabeth, N. J., incl.; Philadelphia, Pa.; Norfolk, Va.; Port Norfolk, Va.; Portsmouth, Va., and Richmond, Va. This will place dealers at other points at a disadvantage and will make higher rates on Scrap Lead from those points than on Pig Iron.

Trunk Line proposal 8,756 covers a shipper's proposition to establish rates on Scrap Copper and Brass C. L., from New York to Buffalo of 31½ cents per 100 lbs.

For further information on these matters, communicate with H. F. Masman, manager Traffic Department, National Association of Waste Material Dealers, Inc., Times building, New York.

EXTINGUISHING ZINC FIRES*

Small tests were made with water, sodium carbonate solution, carbon tetrachloride, silicon tetrachloride, and a frothy mixture as extinguishers for zinc-dust fires. The frothy mixture extinguished the fine most quietly and effectively, so it was tested on a larger fire in 300 pounds of zinc dust. Three 2½-gallon foam extinguishers smothered the fire, but danger of re-kindling had passed only after elapse of several hours, due to retention of heat in the metal by the non-conducting foam blanket.

Thermal data show that water, carbon tetrachloride, and carbon dioxide react with zinc with liberation of considerable heat, carbon tetrachloride producing most. However, no violent reaction occurred when red hot molten zinc was poured into carbon tetrachloride.

Although some fire extinguishing materials may be injurious or may be decomposed in fires to produce toxic gases or vapors, no especially poisonous gases or fumes are evolved from burning zinc itself or from the action of extinguisher material on the zinc.

*Summary of a record by S. H. Katz and J. J. Bloomfield, U. S. Bureau of Mines, Washington, D. C.

A. S. T. M. STANDARDS BEFORE A. E. S. C.

The American Engineering Standards Committee has before it for approval as "Tentative American Standard," A. S. T. M. Standard Methods for Chemical Analysis of Lead, Tin, Antimony and Copper (B18-21).

The A. E. S. C. would be very glad to learn from those interested of the extent to which they make use of these methods and to receive any other information regarding the methods in meeting the needs of the industry. These methods are contained in the 1921 volume of A. S. T. M. Standards. Copies may also be obtained from the American Engineering Standards Committee, 29 West 39th street, New York City. Price 25 cents.

TRADE PUBLICATIONS

Industrial Directory and Shippers' Guide.—A 1,000 page directory issued by the New York Central Lines, which is the largest railroad reference book of the kind ever published. It contains the names of more than 50,000 individual concerns on the New York Central rails, all classified by commodities, localities and railroad facilities. The purpose in assembling the directory lists was to bring the various industrial and business activities into more ready and intimate touch with one another for mutual benefit.

Good Fences.—A catalogue issued by the Anchor Post Iron Works, Garwood, N. J., illustrated and printed in rotogravure, describing their various types of wire and picket fences.

Classified List of Trade and Allied Associations and Publications in the City of New York with Appendix of Governmental Offices.—A booklet published by the Chamber of Commerce of the State of New York, 65 Liberty street, New York, containing a list of trade, and technical associations in New York City, and of publications dealing with these trades and subjects.

Ultra-Rapid.—A folder issued by the American and Central European Importing Company, 59 Fourth avenue, New York, illustrating and describing their new Ultra-Rapid hand drilling machine.

How the Stanley Bill Imperials Inventors, Manufacturers, and the American Patent System.—A booklet issued by the American Patent Law Association, 614-619 Washington Loan and Trust Building, Washington, D. C., containing the testimony of inventors, manufacturers, publicists and scientific societies who successfully opposed a measure similar to the proposed Stanley bill before the House Patent Committee in 1912.

Hardinge Conical Mill.—A bulletin issued by the Hardinge Company, 120 Broadway, New York, covering the principle of operation of the mill, its adaptibility to industrial and metallurgical grinding problems, and describing the different types of mills.

Machinery Supplies and Equipment.—A folder issued by the J. W. Paxson Company, Nicetown Lane and D street, Philadelphia, Pa., containing a short outline of the various kinds of machinery, equipment, materials and supplies which they manufacture for many industrial requirements.

Swartwout Industrial Ovens.—A catalogue issued by the Ohio Body and Blower Company, Cleveland, Ohio, illustrating and describing their various types of ovens for all kinds industrial heating, baking and drying.

Economics.—A booklet written and published by Alfred H. Cowles, Sewaren, N. J., president of the Electric Smelting and Aluminum Company, Lockport, N. Y., on world economics, of which he has long been a close student. A complimentary copy will be gladly furnished to any one interested upon request.

Forging and Heating Furnaces.—A catalogue issued by the W. S. Rockwell Company, 50 Church street, New York, illustrating and describing their various furnaces for this purpose, and containing an article on the fundamental principles affecting the quality and cost of forgings and other formed parts. Descriptions of the heating and handling methods employed to meet a wide variety of plant and manufacturing conditions are also included.

Dipping Baskets.—A catalogue issued by A. P. Munning & Company, Matawan, N. J., illustrating and describing their various types of metal and ceramic dipping baskets and other articles for use in chemical operations.

Grinding, Polishing and Tapping Machinery.—A catalogue issued by the Saint Louis Machine Tool Company, St. Louis, Mo., illustrating and describing their machine tools for grinding, polishing and tapping.

14th Pyrometer Catalog.—Issued by the Wilson-Mauelen Company, Inc., Concord avenue and East 143rd street, New York, illustrating and describing their tapalogs, pyrometers, thermometers, and accessories.

Switches.—Two leaflets issued by the General Electric Company, Schenectady, N. Y., describing and illustrating Type LG-116 Indoor Disconnecting Switches, and Type OC-3 Quick Break Lever Switch.

Northern Cranes and Hoists.—A booklet issued by the Northern Engineering Works, 210 Chene street, Detroit, Mich., describing and illustrating various types of cranes and hoists.

Safety Code.—A booklet issued by the American Engineering Standards Committee, 29 West Thirty-Ninth street, New York, containing the tentative American standard for a "Safety Code for the Use, Care and Protection of Abrasive Wheels."

Standard Chemical for all industries.—A booklet which, besides containing a list of products handled by John C. Wiarda & Company, has some useful chemical data.

Review of the Wrought Metal Business

Written for THE METAL INDUSTRY by J. J. WHITEHEAD, Whitehead Metal Products Company, Inc., New York, N. Y.

There has been a noticeable improvement in the metal business in the past few months, and conditions seem to be slowly but surely getting into more satisfactory shape.

This is due in some degree to the improvement in business generally, and of course a considerable amount of activity may be traced to specialized lines, such as the radio field, and the automobile industry. The wide-spread interest in radio apparatus has created a very considerable amount of activity in that line, with a correspondingly heavy consumption of brass and copper in rod and wire form. This has also been responsible for the consumption of a very large amount of aluminum in sheets, for use in radio apparatus.

The activities of the Copper and Brass Research Committee have also been productive of a wide-spread interest in brass and copper material for use in building lines, and there has been a very heavy tonnage of sheet copper purchased for consumption in this trade. The development of this business has also been greatly assisted by the fact that prices on copper roofing material have been brought down to a very low level.

At the present market prices of sheet copper and copper conductor, for example, there is no reason why inferior materials should be used in building construction. People building houses, either for their own homes, or for speculative purposes, have begun to realize this fact, and the broad-casting of advertising by the copper trade has brought it to the attention of a very large number of people, with the result that orders have been placed much more freely than in many years.

There is still, however, a considerable field to be covered before the actual consumption of copper and brass material for home building purposes can be developed to the greatest possible extent. One of the greatest difficulties which has to be overcome is the tendency on the part of those who come directly in contact with consumers to build up their profits on the various articles made of brass and copper to such an extent as to make the price prohibitive to the consumer.

In other words, it seems that any inquiry on the part of a consumer for various articles made of brass and copper which he might use, immediately develops in the mind of the dealer an idea that he can charge almost any price, regardless of the cost. This tendency cannot be charged to the jobbers or the manufacturers. Both the jobbers and the manufacturers have reduced their prices to a point where there is hardly a normal profit.

The trouble lies entirely with that portion of the distributing trade such as the roofers, hardware dealers and small repair shops, who come directly in contact with the consumer. There is no question whatever that many people who are buying articles

of iron, steel and other metals, galvanized or plated with brass or copper, would buy solid brass and copper articles if they could be purchased from these dealers at prices which were reasonable. We know for a fact, from instances that have been brought to our attention that some dealers have added two hundred to three hundred per cent. to copper and brass articles in offering them for sale to the consumer, whereas they have offered the same people galvanizd iron and plated articles at a price representing about twenty to twenty-five per cent. profit.

It is this tendency that must be overcome by the manufacturers and jobbers of metals. Already there have been steps taken to place in the hands of the consumer correct information regarding the cost of materials in this line. There may be many people in the metal industry who have not realized this condition as an actual fact, and if there are any such there should be some method of bringing this condition to their attention. If the various people who are interested would take advantage of any opportunities that are offered to spread the information regarding the present low prices of metals, and the superior service which they will render in every day use, the movement making t.r a greater consumption of these metals, and a general improvement of business will receive considerable impetus.

The success of Monel Metal, which is among the highest priced, clearly demonstrates the fact that there is a wide field for a product of quality. Monel Metal is not directly competitive with brass and copper to any very great extent, but on the contrary is largely used in fields to which brass and copper are not adaptable. It is in direct competition with many of the various alloyed steel products, and the greatest tonnage in this line comes from fields where the service advantages outweigh the price. It has, however, the advantage of having been handled in such a manner as to provide for its distribution to the consumer at prices which have not been prohibitive.

Of course, the enormous consumption of metals in the large engineering developments and the automobile industry is what constitutes the back-bone of the brass and copper business, but there is nevertheless, a large quantity of business to be obtained in the lines of manufacture which cater directly to the individual consumers. As stated above, there is a realization on the part of the copper and brass manufacturers that this trade must be nursed, and the advertising activities that have lately gone into effect have been productive of a wide-spread interest among the general public.

When this interest on the part of the public has been more dully developed, there is no question that a larger and wider distribution of metals will be possible. It is, however, necessary that the whole problem of distribution be so handled as to place the materials in the hands of the consumer at a price which will not discourage him and operate against his purchasing.

METAL STOCK MARKET QUOTATIONS

	Par	Bid	Asked
Aluminum Company of America	$100	$400	$450
American Hardware Corp	100	158	160
Bristol Brass	25	...	18
International Nickel, com.	25	18	18½
International Nickel, pfd.	100	79	84
International Silver, com.	100	20	30
International Silver, pfd.	100	93	96
New Jersey Zinc	100	145	148
Rome Brass & Copper	100	125	...
Scoville Mfg. Co.	100	315	330
Yale & Towne Mfg. Co.	...	285	300

Corrected by J. K. Rice, Jr., & Co., 36 Wall Street, New York.

Metal Market Review

Written for the METAL INDUSTRY, by METAL MAN

COPPER

New demand for copper was in substantial volume during April, although total sales for the month were less than those for March. Transactions last month, however, to domestic consumers and for export will aggregate from 100,000,000 to 125,000,000 pounds. Home consumption and foreign requirements have been running ahead of production for several months, and there is undoubted proof that the statistical position of copper is slowly but surely mending.

At the beginning of April the market was weak and decidedly in favor of buyers. Lake brands were 12¾c@12⅞c with electrolytic 12½c@12⅝c. Casting grades ranged from 12¼c@12½c for nearby shipment. Prices stiffened up slightly during the first half of the month. A fairly good buying movement developed and sellers were able to realize 12¾c@ 12⅞c for electrolytic delivered at New England points. Export business also showed renewed life, with fresh inquiries from the Orient. Holdings of the Copper Export Association are now understood to be not over 230,000,000 pounds. The original quantity taken over by this corporation early last year was 400,000,000 pounds, and of this amount there has been sold for foreign shipment some 170,000,000 pounds. United States stocks of refined available for quick delivery are estimated at only 330,000,000 to 350,000,000 pounds, including the copper held for export.

ZINC

The market for this metal has exhibited features of strength and activity lately. Early in the past month buyers began to display more interest in forward positions and were willing to enter orders for May and June shipments at an advance of five points over the price for prompt delivery. April opened steady at 4.65c East St. Louis and 5.00c New York. In a short time business increased in volume and prices were lifted to the New York basis of 5.15c @ 5.20c and 4.80c @ 4.85c East St. Louis. Statistics are more favorable to market firmness and have been a factor in establishing higher prices. World's stock of virgin zinc on March 31, 1922, was estimated at 97,000 metric tons of which 57,500 metric tons were in the United States. The estimated production at all sources throughout the world for 1922 is placed at 680,000 metric tons, and allowed a product of 300,000 tons as the United States quota; Poland and Germany to furnish 125,000 tons, and Belgium 100,000 tons. Great Britain is down for 45,000 tons and Australia 25,000 tons.

TIN

The April opening for tin was fairly active at 28⅞c @ 29c for Straits, with Banca quoting 28¾c and American Electrolytic 99% 28¾c. Recent arrivals were large, but the market did not weaken on that account. During the first half of the month both London and New York became firmer. The two markets maintained a sympathic interest in developments at the respective countries. Speculative fervor broke out occasionally at the London Exchange, but American consumers and dealers maintained a conservative attitude notwithstanding the heavy transactions in the London market. However, a good line of business was transacted here around the middle of the month at from 30¼c @ 30⅜c. London operated on a heavy scale the past month, the sentiment abroad being bullish based largely on expectations of a big American demand during the next six months.

Stock in this country, including landing, on April 30, 1922, was 2,731 tons. Straits tin closes quiet at 31c @ 31¼c for all deliveries up to August, with 99% grade 30¼c @ 30½c, nominal.

LEAD

Recent business in lead has been on an extensive scale. Orders of unusual significance were booked by the regular trade during the past month. The pronounced demand for prompt and future positions created a market of decided breadth and strength. Prices advanced rapidly, but soaring quotations only served to develop a more active buying movement. April opened at 4.60c East St. Louis and 4.80c New York, but on the 3rd of the month prices were advanced to 4.70c East St. Louis and 4.90c New York. Sales continued in large volume and demand increasing sellers had no difficulty in raising prices to the level of 5.05c East St. Louis and 5.25c New York. Outside holders in view of the buoyant tone to the market demanded 5.20c @ 5.30c East St. Louis

and 5.35c @ 5.45c for New York delivery. Consumption of lead has expanded at all domestic centers and the prospect is particularly bright for further heavy seasonal requirements over the balance of the year. The high and low prices of lead in 1921 were 5⅜c and 4c respectively, with an average figure for the year of 4.55c.

ALUMINUM

Market for aluminum ruled steady, although there were rumors of recent sales of 98-99% ingots by outside interests at 17¼c. Price of Aluminum Company of America for 99% grade is 20.10c and for 98-99% 19.10c. Outside market quotes 17¾ @ 18c for 98-99% virgin metal, 16½c @ 17c for 98-99% remelted material. April demand for sheets, ingots and scrap was active, with large tonnages taken by automobile manufacturers and other consumers. Pending tariff changes are confusing to importers, but inquiry for foreign product continued on an important scale. Buyers have been inclined to extend their purchases into the third quarter of year, but sellers are cautious about quoting so far ahead.

ANTIMONY

With spot stocks here concentrated and firmly controlled, and expectations of a higher rate of duty being tacked on to the metal under the new proposed schedule of tariff rates, the market advanced from 4½c duty paid to 5⅛c. The market closed firm, with slight prospect of finding any of the importers willing to accept 5 cents duty paid for Chinese or Japanese Regulus of 99% grade. The market closes strong, but buyers are not specially eager to follow the advance to 5⅛c. Cookson's grade quotes 9c. W. C. C. 5¾ @ 6¼c.

QUICKSILVER

Good demand and restricted supplies have lifted prices to the level of $55 to $57 per flask of 75 pounds. Holders offer with reserve and ask full prices for the limited offerings on the market. The recent London quotation was £11 per flask. There is little coming from Mexico at present and no recent arrivals from Italy. The proposed new tariff of 25c per lb., against present rate of 10%, has caused foreign producers to retain shipments.

SILVER

There was a sudden advance in the price of silver in the last half of April. Heavy speculation caused a jump of four cents to 70 cents an ounce in this market on April 19. That price was the highest quoted for silver since November 2, when it touched 70¼ cents an ounce. In London quotations rose to 35⅞ pence an ounce, an advance of 2¼ pence. London was an urgent buyer for account of Chinese banks and was said to reflect improved business in the Orient. Fear of civil war in China was also said to have caused a run on silver. American producers have reaped great benefit from the higher prices, but there was a reaction at close of month from the top prices recently quoted. Official quotations May 1st, were 99⅝c for domestic, 68½c for foreign, with London 34⅞d.

PLATINUM

Commercial value has been stationary for some time, the price holding steady at $85 @ $90 an ounce.

OLD METALS

Improvement continued in the scrap metal market and prices for the various materials classified under this head are firm. Dealers are inclined to be optimistic over the outlook. The firmer markets for some of the chief primary metals has had a stimulating effect upon the scrap situation, and barring an unexpected turn in business conditions dealers anticipate a continuation of good trade. Old lead was specially firm in sympathy with the higher quotations for primary pig metal. Heavy stock closed at 4⅜c @ 4½c, tea lead 2⅞c @ 3c, and battery lead 2½c @ 2.60c. First quality crucible copper ranged from 11c @ 11⅛c and the uncrucibled article 10c @ 10¼c. Light copper from dealers stock was 8½c @ 8¾c, light brass 4⅞c. @ 5⅛c, heavy brass 5¼c @ 5½c, new brass clippings 6½c @ 6⅞c, cocks and faucets 6c @ 6⅜c, and composition scrap 7¾c @ 8c. Aluminum clippings quoted at 13c @ 13¼c, old sheet aluminum 10½c @ 11c. New zinc scrap was held at 3c @ 3¼c. No. 1 pewter was available at 17c @ 17½c, and No. 1 composition turnings 6¾c @ 7c.

APRIL MOVEMENT IN METALS

	Highest	Lowest	Average
Copper:			
Lake	13.00	12.75	12.908
Electrolytic	12.75	12.50	12.707
Casting	12.50	12.25	12.461
Tin	31.75	29.375	30.651
Lead, f. o. b. St. Louis	5.30	4.60	4.969
Zinc (brass special)	5.15	4.80	4.997
Antimony	5.125	4.50	4.885
Aluminum	18.50	17.25	18.066
Quicksilver (per flask)	$57	$49	$52.237
Silver (cts. per oz.) foreign	70	65.125	66.570

WATERBURY AVERAGE

Lake Copper—Average for 1920, 13.136.—January, 1922, 13.875.—February, 13.375—March, 13.125.—April, 13.00.

Brass Mill Zinc—Average for 1920, 5.175—January, 1922, 5.25.—February, 5.00—March, 5.10—April, 5.40.

Metal Prices, May 8, 1922

NEW METALS

Open Market

	Cents
COPPER—DUTY FREE. PLATE, BAR, INGOT AND OLD COPPER. Manufactured 6 per centum.	
Electrolytic, carload lots, delivered	13.00
Lake, carload lots, delivered	13.00-13.25
Casting, carload lots, f. o. b. refinery	12.625
TIN—Duty free.	
Straits, carload lots	30.75
LEAD—Duty, Pig, Bars and Old, 25%; pipe and Sheets, 20%. Pig, carload lots	5.25-5.35
ZINC—Duty 15%.	
Brass Special	5.15
Prime, Western, carload lots	5.05
ALUMINUM—Duty, Crude, 2c. per lb. Bales, sheets, bars and rods, 3½c. per lb.	
Small lots, f. o. b. factory	
100-lb. f. o. b. factory	
Ton lots, f. o. b. factory	17.75-20.10
ANTIMONY—Duty 10%.	
Cookson's Hallet's or American	Nominal
Chinese, Japanese, Wah Chang WCC, brand spot	5.50
NICKEL—Duty, Ingot, 10% ad valorem. Sheet, strip, strip and wire, 20%.	
Ingot	36.00
Spot	36.00
Electrolytic	31½-39
MANGANESE METAL—95-98% Mn., carbon free, per lb. Mn. contained. Nominal	0.75
MAGNESIUM METAL—Duty 20% ad valorem (100 lb. lots)	$1.25-1.35
BISMUTH—Duty free	2.00-2.10
CADMIUM—Duty free	1.00-1.25
CHROMIUM METAL—95-98% Cr., per lb. Cr. contained. Nominal	1.50
COBALT—97% pure	3.00-3.25
QUICKSILVER—Duty 10% per flask of 75 lbs.	$55-$57
PLATINUM—Duty free, per ounce	$85-90
SILVER—Government assay—Duty free, per ounce	.99¾
GOLD—Duty free, per ounce	20.67

Metal Prices, May 8, 1922

INGOT METALS

Silicon Copper, 10%	according	to	quantity	34 to38
Phosphor Copper, guaranteed 15%	"	"	"	18 to26
Phosphor Copper, guaranteed 10%	"	"	"	17½to25½
Manganese Copper, 30%	"	"	"	50 to56
Phosphor Tin, guarantee 5%	"	"	"	35⅝to45⅝
Phosphor Tin, no guarantee	"	"	"	40 to50
Brass Ingot, Yellow	"	"	"	8¼to10½
Brass Ingots, Red	"	"	"	11¼to13
Bronze Ingot	"	"	"	11½to13¼
Parsons Manganese Bronze Ingots	"	"	"	16½to18
Manganese Bronze Castings	"	"	"	21 to33
Manganest Bronze Ingots	"	"	"	11½to15
Manganese Bronze Forgings	"	"	"	30 to40
Phosphor Bronze	"	"	"	24 to30
Casting Aluminum Alloys	"	"	"	18 to21
Monel Metal	"	"	"	38

OLD METALS

Buying Prices		Selling Prices
10 to10½	Heavy Cut Copper	11¾to12
9¾to10¼	Copper Wire	11½to11¾
8½to 9	Light Copper	10 to10½
8 to 8½	Heavy Machine Comp.	9¼to 9¾
5¾to 6¼	Heavy Brass	8 to 8½
4½to 5	Light Brass	6 to 6½
5¼to 5½	No. 1 Yellow Brass Turnings	6¼to 6¾
7 to 7½	No. 1 Comp. Turnings	8½to 9
4	Heavy Lead	4½
4	Zinc Scrap	4½
5 to 5½	Scrap Aluminum, Turnings	7 to 8
10½to11½	Scrap Aluminum, cast alloyed	12½to13½
13½to14½	Scrap Aluminum, sheet (new)	15½to16½
18½	No. 1 Pewter	22½
15	Old Nickel anodes	17
23 to25	Old Nickel	27 to29

BRASS MATERIAL—MILL SHIPMENTS

In effect April 20, 1922.

To customers who buy 5,000 lbs. or more in one order.

	Net base per lb.		
	High Brass.	Low Brass.	Bronze.
Sheet	$0.15¾	$0.17¼	$0.18¾
Wire	0.16¼	0.17¾	0.19¼
Rod	0.13¾	0.18¼	0.19¾
Brazed tubing	0.22½	.....	0.27½
Open seam tubing	0.22½	.....	0.27½
Angles and channels	0.25½	.....	0.30½

To customers who buy less than 5,000 lbs. in one order.

	Net base per lb.		
	High Brass.	Low Brass.	Bronze.
Sheet	$0.16¾	$0.18¼	$0.19¾
Wire	0.17¼	0.18¾	0.20¼
Rod	0.14¾	0.19¼	0.20¾
Brazed tubing	0.23½	.....	0.28½
Open seam tubing	0.23½	.....	0.28½
Angles and channels	0.26½	.....	0.31½

SEAMLESS TUBING

Brass, 18c. to 19c. per lb. base.

Copper, 20¾c. to 21¼c. per lb. base.

TOBIN BRONZE AND MUNTZ METAL

Tobin, Bronze Rod	17¾c. net base
Muntz or Yellow Metal Sheathing (14"x48")	15¾c. " "
Muntz or Yellow Rectangular Sheets other than Sheathing	16¾c. " "
Muntz or Yellow Metal Rod	13¾c. " "

Above are for 100 lbs. or more in one order.

COPPER SHEET

Mill shipments (hot rolled)	19¼c.-20¼c. net base
From stock	20¼c.-21¼c. net base

BARE COPPER WIRE—CARLOAD LOTS

14¾c. to 15c. per lb. base.

SOLDERING COPPERS

300 lbs. and over in one order	17½c. per lb. base
100 lbs. to 200 lbs. in one order	18c. per lb. base

ZINC SHEET

Duty, sheet, 15%. Cents per lb.

Carload lots, standard sizes and gauges, at mill, 7½c. basis less 8 per cent. discount.

Casks, jobbers' prices	8½c. to 9c.
Open casks, jobbers' prices	9½c. to 10c.

ALUMINUM SHEET AND COIL

Aluminum sheet, 18 ga. and heavier, base price	32c.
Aluminum coils, 24 ga. and heavier, base price	30c.

NICKEL SILVER (NICKELENE)

Base Prices

Grade "A" Nickel Silver Sheet Metal

10% Quality	23¾c. per lb.
15% "	25½c. " "
18% "	26¼c. " "

Nickel Silver Wire and Rod

10% "	26¾c. " "
15% "	30¾c. " "
18% "	33½c. " "

MONEL METAL

Shot	32
Blocks	32
Sheet Bars	40
Hot Rolled Rods (base)	40
Cold Drawn Rods (base)	50
Hot Rolled Sheets (base)	45

BLOCK TIN SHEET AND BRITANNIA METAL

Block Tin Sheet—18" wide or less. No. 26 B. & S. Gauge or thicker, 100 lbs. or more, 10c. over Pig Tin. 40 to 100 lbs., 15c. over 25 to 50 lbs., 17c. over, less than 35 lbs., 25c. over.

No. 1 Britannia—18" wide or less. No. 26 B. & S. Gauge or thicker, 500 lbs. or over, 8c. over N. Y. tin price; 100 lbs. or more, 10c. over Pig Tin. 50 to 100 lbs., 15c. over, 25 to 50 lbs., 20c. over, less than 25 lbs., 25s. over. Above prices f. o. b. mill.

Lead Foil—base price—figured on base price of lead at the time.

Platers' metal, so called, is very thin metal not made by the larger mills and for which prices are quoted on application to the manufacturer.

SILVER SHEET

Rolled silver anodes .999 fine are quoted at from 72c. to 74c. per Troy ounce, depending upon quantity.

Rolled sterling silver, 70c. to 72c.

NICKEL ANODES

85 to 87% purity	42½c. per lb.
90 to 92% purity	45c. per lb.
95 to 97% purity	47½c. per lb.

Supply Prices, May 8, 1922

CHEMICALS

In Commercial Quantities—New York Prices

Acid—		
Boric (Boracic) Crystals	lb.	.14
Hydrochloric (Muriatic) Tech., 20 deg., Carboys	lb.	.02½
Hydrochloric, C. P., 20 deg., Carboys	lb.	.08
Hydrofluoric, 30%, bbls.	lb.	.07
Nitric, 36 deg. Carboys	lb.	.07
Nitric, 42 deg. Carboys	lb.	.07¼
Sulphuric, 66 deg. Carboys	lb.	.02½
Alcohol—		
Butyl	lb.	20-25c.
Denatured in bbls.	gal.	.36
Alum—		
Lump, Barrels	lb.	.04
Powdered, Barrels	lb.	.05
Aluminum sulphate, commercial tech	lb.	.02½-.03
Aluminum chloride solution	lb.	.20
Ammonium—		
Sulphate, tech., Barrels	lb.	.04
Sulphocyanide	lb.	.50
Argols, white, see Cream of Tartar	lb.	.27
Arsenic, white, Kegs	lb.	.07½
Asphaltum	lb.	.35
Benzol, pure	gal.	.45
Blue Vitrol, see Copper Sulphate.		
Borax Crystals (Sodium Biborate), Barrels	lb.	.05½
Calcium Carbonate (Precipitated Chalk)	lb.	.05
Carbon Bisulphide, Drums	lb.	.07½
Chrome Green	lb.	.36
Cobalt Chloride	lb.	—
Copper—		
Acetate	lb.	.48
Carbonate, Barrels	lb.	.19
Cyanide	lb.	.58
Sulphate, Barrels	lb.	.05¾
Copperas (Iron Sulphate, bbl.)	lb.	.02½
Corrosive Sublimate, see Mercury Bichloride.		
Cream of Tartar, Crystals (Potassium bitartrate)	lb.	.28
Crocus	lb.	.15
Dextrin	lb.	.05-.08
Emery Flour	lb.	.06
Flint, powdered	ton	$30.00
Fluor-spar (Calcic fluoride)	ton	$75.00
Fusel Oil	gal.	3.00
Gold Chloride	oz.	14.00
Gum—		
Sandarac	lb.	.35
Shellac	lb.	—
Iron, Sulphate, see Copperas, bbl.	lb.	.02½
Lead Acetate (Sugar of Lead)	lb.	.12-.13
Yellow Oxide (Litharge)	lb.	.09
Mercury Bichloride (Corrosive Sublimate)	lb.	.92
Nickel—		
Carbonate Dry	lb.	.40
Chloride, 100 lb. lots	lb.	.30-.40
Salts, single, bbls.	lb.	.11
Salts, double, bbl.	lb.	.11
Paraffin	lb.	.07-.10
Phosphorus—Duty free, according to quantity		.25-.30
Potash, Caustic, Electrolytic 88-92% fused, drums	lb.	6½
Electrolytic, 70-75% fused	lb.	.10
Potassium Bichromate, casks	lb.	.11
Carbonate, 80-85%, casks	lb.	.05
Cyanide, 165 lb. cases, 94-96%	lb.	.50
Pumice, ground, bbls.	lb.	.03
Quartz, powdered	ton	$30.00
Official	oz.	—
Rosin, bbls.	lb.	.03½
Rouge, nickel, 100 lb. lots	lb.	.20
Silver and Gold	lb.	.60
Sal Ammoniac (Ammonium Chloride) in casks	lb.	.07½
Silver Chloride, dry	oz.	.86
Cyanide	oz.	—
Nitrate, 100 ounce lots	oz.	.44
Soda Ash, 58%, bbls.	lb.	.03
Sodium—		
Biborate, see Borax (Powdered), bbls.	lb.	.05½
Bisulphate, tech., bbls.	lb.	.03½
Cyanide, 96 to 98%, 100 lbs.	lb.	.25
Hydrate (Caustic Soda) bbls.	lb.	.04½
Hyposulphite, kegs	lb.	.04
Nitrate, tech. bbls.	lb.	.04
Phosphate, tech., bbls.	lb.	.03¾
Silicate (Water Glass) bbls.	lb.	2½
Sulpho Cyanide	lb.	.45
Soot, Calcined	lb.	—
Sugar of Lead, see Lead Acetate	lb.	.12-.13
Sulphur (Brimstone) bbls.	lb.	.01¾
Tin Chloride	lb.	.31
Tripoli	lb.	.03½
Verdigris, see Copper Acetate	lb.	.48
Water Glass, see Sodium Silicate, bbls.	lb.	.02½
Wax—		
Bees, white ref. bleached	lb.	.55
Yellow, No. 1	lb.	.24
Whiting, Bolted	lb.	.02½-.06
Zinc, Carbonate, bbls.	lb.	.14-.18
Chloride, 600 lb. lots	lb.	.06½
Cyanide	lb.	.42
Sulphate, bbls.	lb.	.03½

COTTON BUFFS

Open buffs, per 100 sections (nominal).

12 inch, 20 ply, 64/68, cloth	base,	$31.00
14 inch, 20 ply, 64/68, cloth	base,	38.55
12 inch, 20 ply, 84/92, cloth	base,	42.55
14 inch, 20 ply, 84/92, cloth	base,	57.35
12 inch, 20 ply, 88/96, cloth	base,	46.20
14 inch, 20 ply, 88/96, cloth	base,	62.25
Sewed Buffs, per lb., bleached and unbleached	base,	.50

FELT WHEELS

			Price Per Lb. Less Than 100 Lbs.	100 to 300 Lbs.	300 Lbs. and Over
Diameter—10″ to 16″		1″ to 3″	2.60	2.50	2.35
″	6″, 8″ and over 16″	1″ to 3″	2.70	2.60	2.45
″	6″ to 24″	Over 3″	3.00	2.90	2.75
″	6″ to 24″	½″ to 1″	3.60	3.50	3.35
″	4″ to 6″	¼″ to 3″	4.60	} Any quantity	
″	Under 4″	¼″ to 3″	5.20		

Grey Mexican or French Grey—10c. less per lb. than Spanish, above. Odd sizes, 50c. advance.